

The AMERICAN RIFLEMAN

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DECEMBER 15, 1923

**Selling Rifle Shooting to Your
Community**

By C. B. Lister

Groups—Normal and Otherwise

By Lt. A. M. Siler

Shotguns, Powders and Cartridges

By Capt. Chas. Askins

Every Day Ballistics

By Maj. G. P. Wilhelm

Rifle Shooting in Schools and Colleges

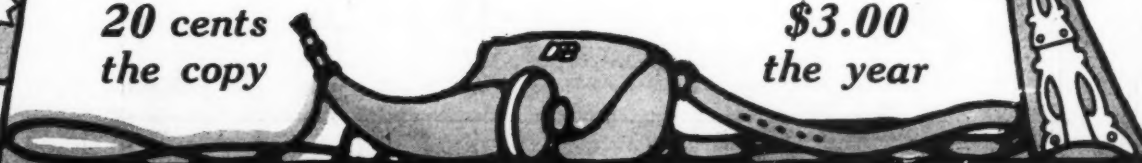
By W. R. Stokes

Velocity, Energy and Recoil

By Capt. E. C. Crossman

**20 cents
the copy**

**\$3.00
the year**





MR. WALTER T. HANSEN, California
Winner Individual Short Range Match. (U. S. Cartridge
Co. Trophy) Score 393

CALIFORNIAN TAKES BRONZE TROPHY

Californians made a great clean-up in the Small-Bore Matches at Camp Perry this year by winning four of the new trophies in addition to having a majority of the members on the West Team and taking that trophy home with them.

Walter T. Hansen, a Californian with a record for doing things right, passed his eyes over the numerous new Small-Bore Trophies at Camp Perry and decided that he liked Bronze best. He viewed the massive Bronze Hercules, but the conditions called for a two-man team, so his gaze wandered back to the United States Cartridge Company's Bronze Indian and he then and there made up his mind that California lacked a Bronze of that description. Now, many riflemen have viewed the N.R.A. collection of trophies the same way but only a few have realized their ambition to take one of them home. Deciding which trophy you want, and then going out and winning it is another thing. But Walter Hansen had made up his mind—positively, and in doing so he had also selected Remington Palma .22 Long Rifle Cartridges to help him do it.

Don't Worry!

Don't worry about
the other fellow's
score.

Let him
worry about yours.

Shoot Palma

REMINGTON TROPHY

Won by
FRANKFORD ARSENAL
RIFLE CLUB

"The Frankford Four," Alwin Williams, Charlie Johnson, Raymond Betts, and Charlie Hogue, the quartet of Keystone-ites that are liable to "break up" a rifle team match any time, all



REMINGTON
TROPHY

but made a perfect score in winning the beautiful Remington Trophy at Camp Perry this year, losing only one point out of the possible score of 400. The course consisted of twenty shots for each man at 150 yards.

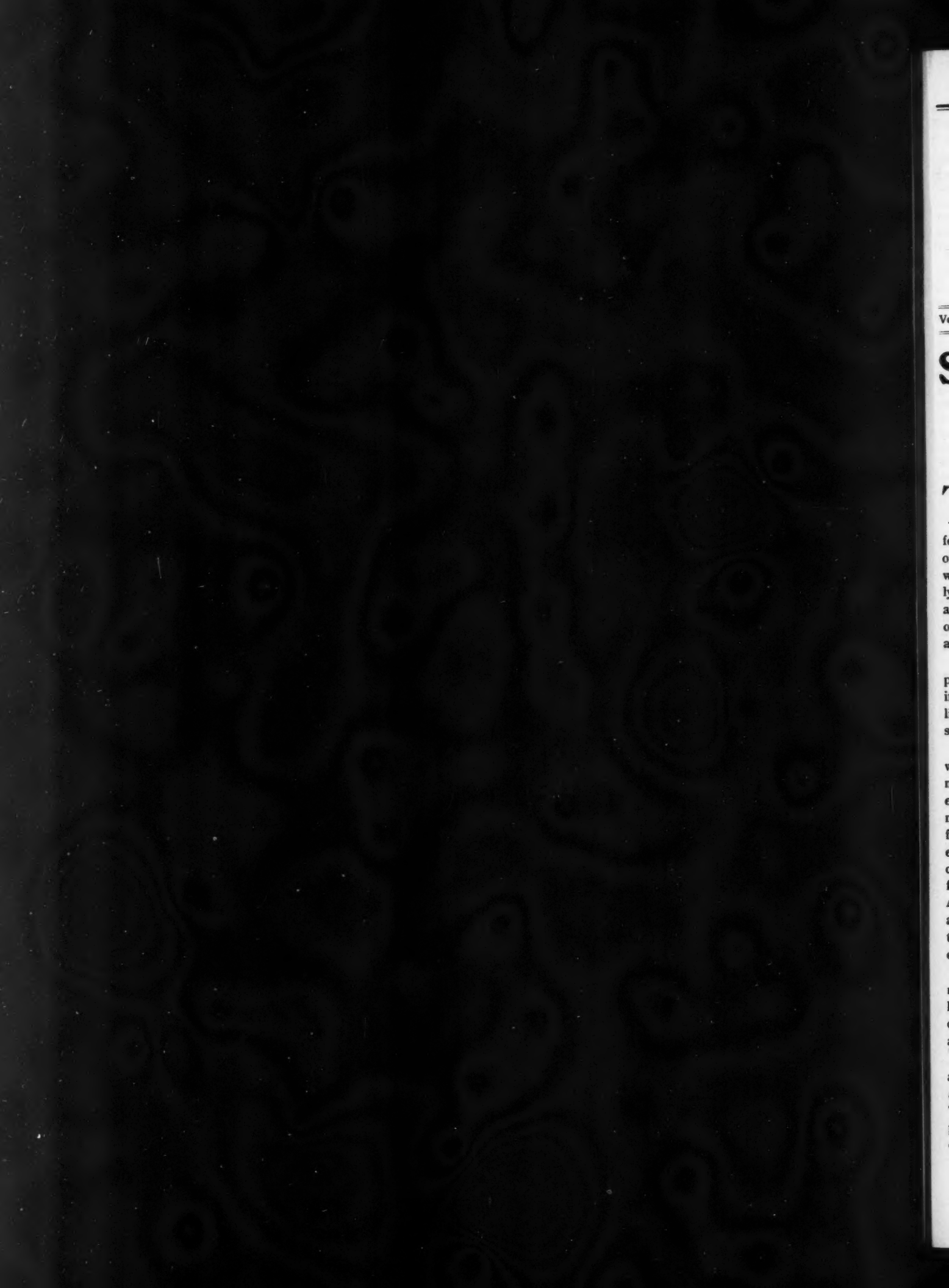
The three highest men on this team shot Remington .22 Long Rifle cartridges which clearly indicates the extremely uniform high accuracy of this Premier of Long Rifle Cartridges.



FRANKFORD ARSENAL RIFLE CLUB TEAM
Winner Inter-Club Match (Remington Trophy) Score 399

Remington
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The AMERICAN RIFLEMAN

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Selling Rifle Shooting to Your Community

By C. B. Lister

Part I

THE PRELIMINARY ARRANGEMENTS

THERE comes a time in the life of every club when it desires to put over a real, enthusiasm-arousing, member-getting, boosters' campaign. If present indications count for anything, there will be more activity along this line carried on by rifle clubs during the present season than the game has witnessed in its fifty-two years of organized effort. The underlying reasons for such a campaign are many. The club may need an influx of new members in order that their dues will pull it out of the financial hole. Range facilities may be unsatisfactory and a new location needed.

Quite frequently the clubs which started with brilliant prospects find enthusiasm waning, and something has to be done to instill new pep. And then there are the occasions when some live, healthy club has the energy to want to be up and doing something worth while and to aid the club and the game.

Whatever the reason for the campaign, the affair must go over with a bang. A failure under any circumstance is worse than no attempt at all, because it leaves a bad taste in the mouths of every one concerned. There are of course more ways than one to make such a campaign a success, but the scheme outlined in the following articles hold out more promise than any that have been encountered in several years of correspondence and personal acquaintance with the rifle clubs of the country. The basic plan for the meeting suggested was, so far as is known, evolved by the Akron, Ohio, Club, where Malcolm Dean Miller, Walter Booth, and various other notables hold forth. It has been elaborated on to some extent, and the scheme for the follow-up is a composite of many plans that have been tried out by various clubs.

If the entire project savors too much of playing to the new man, let it be known now that many shooting organizations have learned, to their sorrow, that their continued success depended on taking care of the new men and instilling the regulars with a spirit of service to the beginners.

The rifle shooting game that is to take and hold its place as a National pastime must be a fraternity of sportsmen, and not an organization of querulous, hide-bound "possible" shooters. The conduct of our campaign resolves itself naturally into three parts, the preliminary planning and publicity, the actual conduct of the meeting, and the follow-up.

The basis of the planning is of course the form of program to

be followed. The usual formal business meeting is all right for the club members, but it does not attract the mildly interested outsider, nor does it, as a matter of fact, bring out more than a baker's dozen of the club's active members. A dinner or luncheon, not too expensive, is better, particularly if you can, as an added attraction, add some local celebrity of the game or the target field as a speaker. But dinners have a sound of formality which tends to keep away the outsider.

Comes then the Great Idea. It is based on the fact that every American is interested in a gun. The "education" (?) which he has had since his youth may have placed him in the anti-class, in which case he is interested in guns because of their murder dealing and horror provoking proclivities but most people are interested in them because they recall days in the open as a youngster, stories of African game expeditions or tales of personal encounter with the four-footed denizens of mountain and forest. Generally the average citizen is not interested to the point of spending any great amount of time or money, but he is interested to the extent of joining the crowd around any exhibition of "Buffalo Bill's shooting irons," revolvers carried by "Jesse James'" gang, captured German rifles or what-not that may be on display. If you can catch him in this mildly curious mood and lead him on a little, the chances are good for you to sell him on the sport of rifle or pistol shooting before he realizes that he has been interested.

Your preliminary publicity therefore should make it known that there will be a display of "practically every high power arm used in the field for hunting or military purposes, including the famous Canadian Ross, the German Mauser, the Krag, which was the rifle used by our soldiers in the war with Spain, the Service Springfield, and handsome sporting rifles rebuilt from the service arm." In addition, there can be featured "a complete moose hunter's outfit, as well as speed cameras that have been used in the field for making pictures of wild game." Motion pictures showing any one of a number of phases of life in the open may be obtained through the courtesy of "Field and Stream," and will provide another splendid drawing card. In conjunction with the motion pictures, as the premier attractions, leaving out the movies, some local nimrod can be persuaded to tell his story of a trip into the game country of Africa, Thibet, Canada, New

Jersey, Butler County, Pa., or any other foreign game field that he may be familiar with. As many trophies of the hunt as can be gathered together from local sporting goods stores and sportsmen should be on hand.

Regardless of whether he has ever shot anything bigger than an air rifle, the average man has pipe dreams of the trip he wants to take some day into the open for big game. He has visions of a sun and wind tanned individual, pack on back, trailing through the North woods, of camp in the open, of hours on the trail, and of the final fatal shot. Or he is more ambitious and lives over in his mind the more extensive African expedition with its lions, elephants, and insects; a handful of white men and a caravan of black. This type of sportsman probably has never given the rifle club more than a passing thought. In his mind, members of the club spend their time blazing away at immovable paper targets. It seems to be impractical shooting to him and he passes it up. But let him know there is going to be a mighty fine collection of guns for him to look at, to handle, and to have explained to him, that the mounted trophies of other hunts similar to his pipe dream are to be on exhibition, and that a man who has been there is going to tell about it all, and Mr. Average Citizen will drop in to look around.

Once you have him there with his interest assured, his enthusiasm can be aroused and his guard is down for a turn of the talk into how all of these things tie up with the work of the rifle club. There is plenty of sport on the range for those who cannot go to Africa or the moose country. There is an ample supply of good fellowship at the range, and there is plenty of thrill to the recoil of the rifle and the smell of the powder smoke, whether the trigger be pulled on the range or in the field.

The arrangement should provide for an ample stock of club application blanks, blank checks on local banks, and pens and ink for the signing up of applicants. See that the police are invited. No one in the community should have a greater interest in straight shooting than they. Take it up with the banks, express companies, and postal department, and see if they do not think that their messengers should be a little better equipped and trained to handle the guns that they carry. Do not overlook the American Legion or the National Guard, and see if you cannot get word into the senior class of the high schools. You have no more fertile field to work in than there.

Some one who "knows how" must be designated in advance as master of ceremonies. Men who know the exhibits must be placed in charge of them. Good talkers, good mixers, should be designated for these posts and to mingle in the groups that will form. They must keep the conversation, the formal notions that may be presented, and the discussions confined strictly to the points in hand. A "gun fitter," someone who can tell the tyro whether the stock of this gun or that

gun "fits," would be a most valuable edition.

A reporter from the local newspaper is not to be overlooked in the planning, or if no professional scribe can be obtained, a club member must be told off to properly "cover" the event.

Decorations will depend on the room in which the exhibition is held. If available, trophies won by the club or club members in rifle matches, as well as trophies from the game fields, will serve. A few exceptionally good targets with "What the same men did when they joined the club," tacked up side by side, will serve to hearten the man who is just thinking that "he wouldn't have a chance with these fellows." Pictures of the range showing coaches in action will help. Anything that gives the shooting atmosphere without suggesting that "this is no place for a novice" will assist in putting your prospects in the proper frame of mind to sign on the dotted line.

Miniature rising bear, running deer or sheep, or bobbing woodchuck targets with bristol board or paper mache "scenery" may be rigged up to show how they work on the outdoor range if a backstop is available for actual firing. These little models will show the hunter how the work of the rifle club meets his practice needs in a way he had not suspected. Firing should be limited to one string per man, as the bigger purpose of the meeting is likely to be lost sight of if the crowd starts shooting. Better to have working models here and leave the firing for some other time.

"Make your Committee as small as is consistent with the actual work required. Give every committeeman a definite job. Have them all report at least three days ahead that their job is done. Give the jobs to workers, not to 'prominent citizens.'" In those four sentences lies the secret of success or the reason for failure! Prominent citizens are a desirable asset to any club, but they are too busy with other things to make good committeemen.

Having decided just what is to be done, what the displays will contain, what the feature of the evening will be, get your publicity into action at least a week ahead of time. If you have a Sunday paper play it up strong. Men have more time to read Sundays. Pick out some salient point and feature it, running in the other items of interest as you go along. Successful publicity must first attract the eye, then hold the attention, then induce action.

Such being the case, slam right into your feature, in the first line—"An unusual opportunity to examine a collection of the finest handiwork of American and European gunsmiths will be afforded" etc., or "The Tuskers of British East Africa, as I saw them"; by "—," the well-known local big game hunter, — will be an added feature of the exhibition of hunting and military arms of America and Europe." That not only attracts attention and causes the reader to want to see what the rest of it is going to say, but if the idea is carried through to the end it is pretty likely

to induce action. Particularly if the pow-wow is featured three or four times during the week. Repetition of an idea is one of the best methods of driving it home. A start of this kind also gives the heading writer on the papers something to grasp quickly and he will reward your kindness with a headline that will still further serve to attract attention.

A series of short articles on rifle shooting to start about the same time as your preliminary write-up on the meeting and to continue for three or four weeks thereafter should be arranged for if possible. Local newspapers frequently need small "fillers" to round out their columns and will be glad to use your little articles. Particularly this will be true if your campaign is a success and the whole community starts to talk rifle shooting. If you have a member with the spirit of Mark Twain, O Henry, or Irvin Cobb stowed away in his chest, the following subjects will suggest a fine series of short, spicy, articles to be run the first week in connection with your preliminary work:

Rifle Shooting as a Sport—Monday

The N. R. A. Competitions—Wednesday

Rifle Preparedness—Thursday

The Marines at Belleau Wood—Friday

All these subjects are the sub-heads which should be used under a uniform heading such as "American Rifle Shooting" so that people will become accustomed to seeing them and will know what to look for. A point to be kept in mind is that the best material should as a rule be run in the two or three days immediately preceding the Range Day or Range Night. The inspiration aroused by such material will then be more effective.

Whether you use show cards will depend on the club's financial condition. They are good if well executed. Everywhere the public goes it reads about the exhibit and out of sheer curiosity the public becomes interested. Just as the public automatically says "Wrigleys" instead of "chewin' gum." Cards should be carefully worded. Use short, easily read, and easily understood phrases well spaced. Most printers understand this kind of work well enough to be of assistance.

All of this publicity is aimed at the public. Remember that.

Forget your members, they will be on hand if the publicity is good enough to attract rank outsiders. If you go to the trouble of circularizing your members, go a little further and include a return postal. It is surprising how much that helps to show them you mean business. And while a man may promise you on the street that he will be there and then forget it, mighty few men overlook a date for which they have signed an acceptance.

All of this has been more or less "sketchy." A framework of ideas only has been given. The elaboration into a complete structure must perforce be guided by local customs and interests. But around these principles the preliminary arrangements for a real boosters' party can be built. The same plan will be followed in succeeding articles appearing in the next two issues—"Conducting The Meeting" and "The Follow-up."

Groups—Normal and Otherwise

By Lieut. A. M. Siler

THE writer in the following article embracing notes and observations of the last National Matches, would in the forefront acknowledge his indebtedness for the primary idea to Mr. R. V. Reynolds for his article, "Making the Sighters Count," in the AMERICAN RIFLEMAN of August 1, 1923. The article mentioned came to his attention while engaged in the pleasant occupation of trying out for the Infantry Team, and proved of so much benefit to him that the ideas expressed therein remained constantly in his mind during the season and throughout the National Matches, and have impelled him to pass on to others a few of the observations in connection therewith. The subjects of his observation included practically every type of shooter in attendance at the matches, from C. M. T. C. students, civilians, National Guardsmen, to individuals of the regular services, and the targets illustrated were actually fired during the matches and plotted by him in his notebook, shot by shot, with notes on the corrections involved. Failing to make the Infantry team, and being in consequence assigned varying duties, such as range officer, instructor, etc., gave unusual opportunities for the observations recorded and the study that developed therefrom.

In the beginning, let me state that for purposes of study contemplated, individual shots for the whole were not considered except in their relation to the normal "group" of the individual concerned, and for purposes of comparison the writer conceives in its simplest form that in general the typical shot group consists of five shots, one at 12 o'clock, one at 6 o'clock, one at 3 o'clock, one at 9 o'clock, and one at the center, the size of this group varying with the individual, the rifle, the ammunition, and the weather conditions. In the following article when "normal group" is used this is the group that is meant. Mr. Reynolds in his article referred to assumes an individual's group to be a little more than half the width of the customary bullseye, but in actual practice it will be found that only exceptional shots are capable of such a group, and this article is written in the endeavor to assist the ordinary shot. It is therefore safer by far to assume that the average group of the individual is, if anything, rather larger than the bullseye, and this assumption will be considered as having been made.

Referring to Fig. 1, shot by the writer (first five shots in the President's Match, 600 yard stage), and to the observations of Mr. Reynolds, it will be observed that the first shot

was a 6 o'clock bull just in. As the spotter showed, the writer remarked, "I wish I knew to what part of the group that shot belonged." Not knowing, and being practically certain that I had a fifty-fifty chance of going out the next shot anyway, a half-minute extra elevation was taken on the next shot with the result that went out of the top. This located the first shot as the 6 o'clock shot of a "normal group," and a return to the original elevation brought the succeeding shots where they should have been.

Fig. 2 was fired by a civilian at 600 yards in one of the individual matches, and is a typical instance of a misplaced group. After the first shot, a trey high to the right, he was observed to lower his elevation, but either thought his windage was all right, or else forgot to change it. Throughout the rest of his score no changes were made, and when he was settling down for his tenth shot the writer remarked to a friend, showing him the plot of the score, "By all laws of averages his next shot should be a three at 4 o'clock." I have no doubt in the world that that civilian is to this day wondering where that trey came from on his tenth shot, while anyone can study his group and see why very easily. He, by the way, was not keeping a plot of his shots.

Fig. 3 was fired by a member of a National Guard team to which the writer was for a

few days attached as an assistant instructor. The firer "thought" that he had "pulled" the second shot, which, to the official coach's mind seemed to be borne out by the third shot. After the fourth, I pointed out to him that the four shots formed a group of about normal size for the individual firing. He thereupon had him take windage, but unfortunately gave him the full correction as indicated by the fourth shot—1¼ points. He told the writer this too late to catch the fifth shot, which went where it had about an even chance to go—out at 9 o'clock. Taking off a half-point of the false windage brought his group back to center. The firer, seeing his eight and ninth shots together at five o'clock, and without instructions to do so, raised his elevation a half-minute with the logical result—a four at 12 o'clock.

Fig. 4 was fired by the same man as Fig. 3, but after a few days more practice. As remarked by Mr. Reynolds in his articles, the first two shots were most unfortunate. But the evidence of the third shot located the group fairly well, and a quarter-point right secured a total of forty-eight for the ten shots.

Fig. 5 was fired by a personal acquaintance of the writer who is rather noted for being extremely cautious about sight changes. He is also of quite a nervous temperament. 1, 2, and 3 should have been sufficient evidence to make proper windage correction, but only the fourth shot going out of the black convinced him that something was wrong. This apparently somewhat rattled him, for his shots immediately grew more scattered, and when his sixth shot very properly went toward the top of the bull, he promptly corrected downward, neglecting the evidence of the former five shots and evidently believing that he should be able to hold about a five-inch group in the center. Seventh shot, of course, out. He went back to original elevation, but by this time was thoroughly up in the air, and failed to hold the tenth in also—score 47.

Before we leave the long ranges, the writer is impelled to remark again that the group of the average individual is very rarely smaller than the bullseye, and to mention that peculiar circumstance that practically everyone has observed at a thousand yards a bullseye on the first shot, and a miss on the second. If the individual will consider that the bull is 36 inches in diameter, and that there are only 18 inches of white target above or below is (remembering always that this individual most likely will not hold less than a 36 or 40-inch group), he will see

(Continued on page 14)

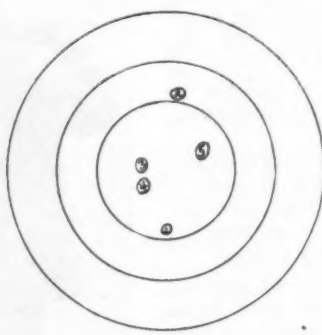


Fig. 1

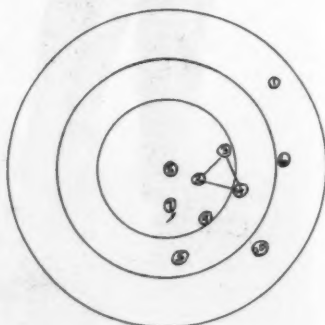


Fig. 2.

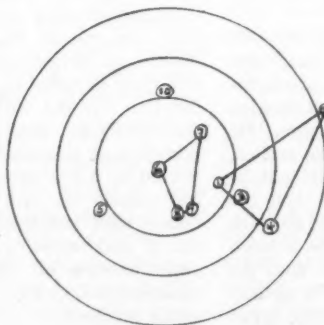


Fig. 3

Target Rifle Shooting in High Schools and Colleges

By Walter R. Stokes

Part IV

BESIDES prone, there are three other positions in general use: Standing, kneeling, and sitting. The most natural firing position, and the one with the greatest historical and most romantic back-

into aiming position, butt against the right shoulder, right hand grasping the small of the stock, face against the comb, the weight of the rifle borne upon the thumb and first three fingers of the left hand. The thumb rests

straight to avoid the muscular strain occasioned by an bended knee.

The weight of the body is divided between the two feet and legs to prevent undue strain on either one alone.

The right elbow is not forced up in the air, but is permitted to drop to the natural position.

Some additional steadiness can be gained by holding the rifle between cheek and right hand in a mildly vice-like manner.

The butt should be held firmly against the shoulder.

The left thumb and fingers, which have to support the weight of the rifle, may be greatly strengthened in a short while by a daily practice of pushing the weight of the body off the ground a few times, with only the toes and finger and thumb tips bearing the strain.

The sling is of little, if any, use in the standing position, and should not be used. As has been shown previously, the sling may be used to advantage only when certain stresses



Above: Fig. 17—A High Position, Better for Some Shooters
Below: Fig. 18—The Standing Position, as Described

ground, is the standing position; the kneeling position probably follows it in these respects. The prone and sitting positions are the unspectacular developments of more prosaic modern times, in which steady holding and concealment of the firer have been forced in military operations by the advent of accurate, long-range firearms. The tendency of civilian riflemen in this matter has by analogy naturally followed that of military men, so that today all four positions are used in target shooting.

THE STANDING POSITION

The standing position is at once the easiest and the most difficult of the firing positions; it is the easiest position to assume, but steady holding in the position is a matter of unusual difficulty. On this latter account, firing in the standing position tests and develops the best qualities of a rifleman as no other position does.

The standing position is assumed as follows: The shooter, being erect upon both feet, turns his left hip toward the target and places his feet two or three feet apart, in such position as seems to give the best bodily balance. He has both feet perfectly flat upon the ground, both legs straight (the knees should not be bent, the left hip thrust forward, and the weight of the body resting equally on each foot. The forward thrust of the hips is aided by turning the left toe to the right until the foot is parallel to the firing line. The shooter places his left elbow upon his left hip, upper arm resting along his side, and brings his rifle

under the trigger guard, and the fingers under the fore-end. The thumb and fingers supporting the rifle should be bent as little as possible to eliminate unnecessary strain.

Following is an enumeration of some of the most important points concerning the standing position:

As in all positions, muscular strain should be reduced to a minimum in the standing position. This is the reason the left elbow is supported along the body and on the hip, instead of having the left hand extended under the fore-end with the elbow unsupported; such a position will do for a few shots, but cannot be maintained with steadiness for a long string of shots because of the excessive muscular strain involved.

The legs are kept





Fig. 19—Studying the Details

and supports are present; these cannot all be obtained in the standing position.

In firing standing two sorts of unsteadiness affect the shooter; one is a swaying of the body and the other is a vibration communicated to the rifle by tensed muscles. With a beginner the body sway is generally the more pronounced and annoying disturber of steady holding.

Both of the sources of unsteadiness in standing shooting may be overcome by a great amount of mere aiming drill, which will induce needed muscular control and development; this sort of practice is highly urged.

There is a decided tendency when firing standing, because of unsteadiness, to jerk the



Fig. 21—The High Kneeling Position

trigger off as the bullseye "goes by." This tendency must be curbed, for it leads to erratic shooting. While the trigger cannot with success be squeezed as slowly as when shooting in the prone position, nevertheless it must be gotten off smoothly, since a disturbing jerk will have an unusually disastrous effect with the rifle held as lightly as it is in the standing position.

The young rifleman who is discouraged by poor results in the standing position is advised that attainment of real ability in this position is accomplished only through long-continued hard work, but that the rewards of the shooter who perseveres to become a good standing shot are proportionately great, both as to his success in match shooting and as to his general development.

THE KNEELING POSITION

The second to the standing position in point of difficulty comes the kneeling position; here again the body and rifle have little support, but the position is steadier

than standing because the body is lower and better supported, with less tendency to sway in consequence, and because the left arm is better supported.

In both the kneeling and sitting positions individual variations in the physical structure of shooters must earnestly be taken into account and the details of the position worked out in accordance therewith, it being remembered that the elimination of muscular strain and the obtaining of physical comfort are objects of prime importance as to all the shooting positions.

The basic kneeling position, variations of which will be taken up later, is assumed as follows:

The shooter gets in his sling as for shooting prone; he kneels on his right knee, knee pointing at a right angle to the direction of the target, and sits upon his right heel, right toe doubled under the heel; his left foot is flat upon the ground, shin perpendicular to the ground, toe pointing to the right front; he places the point of his left elbow just on and in front of the point of his left knee, flat of the elbow resting upon the flat of the knee. After forcing the butt of the rifle into his right shoulder he has fully assumed the position and is ready to fire. Fig. 21.

The position shown in Fig. 21 offers a convenient starting point from which variations can be worked out, and it is the only kneeling position possible to be assumed by some few shooters.

In the position described it will be noticed that the left elbow is rather insecurely supported and that the right toe is painfully cramped. Most shooters are able to overcome these two difficulties by adopting one of the two positions shown in Figs. 22, 23 and 24.

It will be observed that in both of these



Fig. 20—A Standing Position Often Used in Military Shooting and Hunting but Not Adapted to Fine Gallery Shooting



Fig. 22—A Better Position, Sitting on the Foot

positions the right toe has been turned in toward the front and the weight of the body now rests partly upon the side of the foot; the entire length of the right shin now touches the ground, adding to the area of support, and distributing the weight of the body to better advantage. In this position there is no heavy strain upon any particular portion of the left leg or foot and both are well supported on the ground. The only difficulty likely to be encountered arises from the fact that only a limber ankle can properly be bent into position. Often, however, a little practice in gradually stretching out the tendons in a stiff ankle will enable the shooter to take the position in comfort, even though he was unable to do so at first. As a matter of fact, it has been found that the majority of young shooters have such limber ankles that they are able to turn the foot under and sit on it without any special practice at all.

In Figure 22 it will be noticed that the left foot, sole flat upon the ground, is drawn back near the right foot, and that the left elbow is well forward over the knee, this being made possible by the lower position of the body when sitting upon the side of the foot instead of upon the heel. The shooter has his left elbow directly under the rifle or a little to the right of it; much of the weight of his body is thrown forward on to the point of contact of upper arm and knee;



Fig. 23—How It Looks From the Rear



Fig. 24—Kneeling With the Left Leg Extended

this has the double advantage of reducing strain upon the right leg and foot and of steadying the left arm; also when a high-powered rifle is being fired the shooter will be rocked back out of position by the recoil unless sufficient weight is thrown forward to counterbalance the backward push of the recoil. Personally, I regard the kneeling position shown in Figure 22 as the steadiest and generally best of the kneeling positions.

The position illustrated in Figure 24 shows the left foot well extended to the right front, with the side of the left foot, instead of the sole, resting upon the ground. The left upper arm rests for a considerable distance along the inside of the upper shin and knee. This is a very good position, but has the disadvantage that a heavy strain is placed upon the muscles of the left leg in such a way that no amount of practice can be very effective in eliminating it. The position shown in Figure 22 is favored for the reason that it produces less

muscular strain than any other position.

In the kneeling position tighter sling adjustment may be used than in the prone or sitting positions, which require about the same adjustment.

THE SITTING POSITION

The technique of correct position is a matter admitting some proper individual differences as to each of the positions, but probably the sitting position offers in this respect more opportunities for variations than any of the others. In every sitting position, however, the shooter sits upon the ground with his elbows supported by his knees or shins. Since he thus sits upon the ground and has both elbows supported, he finds the position much steadier than the standing or kneeling positions. The thing which is likely to trouble him most is that his legs tire from the strain of supporting his elbows, and it is in an effort to eliminate this factor that several different sitting positions have been developed.

(Continued on page 15)

Shotguns, Powders and Cartridges

By Capt. Chas. Askins

Part III—Shotgun Powders

NOW at last we have reached shotgun powders. These are of the same nature as smokeless rifle powders. Alike, they are governed as to their rate of burning by resistance; they have their range of flexibility also, though few know anything about that or pay any attention to it. Nitro shotgun powders have been in use a long time. Displacing black powders; they were treated as though the only difference between the two propellants was that one developed a cloud of smoke and the other did not. In attempting to load them we followed the same theories and the same processes that would have been followed with black powder—that is, the higher the velocity desired the more powder demanded, and the longer the barrel must be in order to consume the charge. Powder and ammunition makers knew better but we didn't pay much attention to them. As a matter of fact our big ammunition concerns have always been shy on publicity; they have reasons for everything they have done, but such reasons never became known. When some cartridge factory told us that it wasn't any use to put more than two and a half drams of powder in a twenty bore shell, since about all the abnormal charge did was to add to breech pressure, we didn't believe them—thought perhaps that they were trying to economize at our expense. We had loaded black powder and when we wanted our shot to travel a bit faster or to strike a bit harder, we put in another quarter of a dram or so of powder. No harm was done except the gun kicked a little harder, and we got results. The whole proceeding was obvious, and when we wanted power we put powder in the case. Of course that has to be done yet, but there are limits that we know nothing about, and the ammunition manufacturers have studied resistance if we have not. They know that the power embodied in smokeless powder may be translated into terms of velocity, when the powder is used in its correct charge, in standard loads, powder being given due resistance and not undue resistance. They know as well that the power may be translated into terms of abnormal breech pressure instead of shot drive, under certain conditions. A certain standard load of smokeless powder may burn in twenty-four inches of barrel length, with normal pressures and a smooth, fast drive to the muzzle; increase the powder charge a half dram (a quarter of a dram, in a twenty bore) and the powder may all burn in sixteen inches of barrel length, accompanied by great heat, great pressure and some little increase in velocity; increase the powder charge another quarter of a dram, and all the powder will be consumed in ten or twelve inches of barrel, and the powder has become

so fast that it hardly has time to overcome the inertia of the load, but wastes its power in trying to burst out.

Possibly we granted that the ballisticians might be right about breech pressure running to extremes when undue powder charges were used, but we intended to overcome this handicap by thick, powerful, and long barrels—our barrels were so strong that they could not be bursted and we went ahead with the big loads. Nothing came of our plans because the powder exhausted its strength at the breech and thereafter the lessening gas pressure had to simply push against friction and weight. Very few questioned the flexibility of the powder; in fact the term flexibility was hardly heard of—powder was powder and it gave us the velocity we wanted, if we put enough of it into the shell.

We have seen what burning rate and flexibility means in rifle powders, a certain powder burning normally at a breech pressure of fifty thousand pounds, with a flexibility which permitted pressures of ten thousand pounds minus or plus. Few of us who have tried to load rifle powders will have any doubt about that whatever. All shot gun powders have their range of tolerance or flexibility, too, and the factors which govern them are a good deal more complex than the factors which govern the use of rifle powders. With a rifle the bore is fixed, perhaps to the thousandth of an inch; the shell chamber is fixed, with a very slight tolerance minus or plus; the bullet is a fixed quantity, not varying perhaps a grain in weight or the thousandth of an inch in diameter; the powder charge is fixed through the use of a fine scale which should weigh within a tenth of a grain; barrel lengths are uniform for that cartridge—the result is uniform pressures, uniform velocities, uniform energies, and admirable uniformity through a long series of shots. The ammunition loader knows how he got results and why; if he desires to change his cartridge in any particular, he knows what to change and why he does it.

What is fixed about shot gun ammunition or the gun either? We have all lengths of barrels, all diameters, many lengths of cases, many variations in every barrel factor, many variations in every shell factor, and yet one powder must do equally well in all. We have abused shotgun powders shamefully, and have been forced to put up with moderate results where we should have superior results. It is high time that some things about shotguns and shotgun ammunition should be standardized; ammunition factories would further this but we won't let them. Every man is going to have what he wants or know the reason why not. We are writing this in the attempt to make some of the reasons plainer.

Beginning with the gun, who knows two different shotguns of like bore but different makers, which have precisely the same barrel diameter? Did any one ever notice a difference in the diameter of the two barrels of his double gun? Barrels by the same maker may vary quite a bit, and barrels from different makers surely will, yet the barrel is a resistance factor, and a few thousandths of an inch makes a difference in friction and a difference in breech pressure; no less with patterns. Where the barrels vary, either may handle some load perfectly, but it is rare that both will handle the same load perfectly. Cones have a marked influence in breech pressures, on the burning rate of the powder, on patterns and on velocities, yet cones vary from maker to maker. One shape of cone is adapted to a heavy charge, another to a light charge, but who knows the shape of cone he has in his gun or what suits it best? The chambering will also vary with the maker and perhaps with the model, for pump and automatic shotguns are liable to be chambered a trifle wider than double guns or single barrels. Not all manufacturers use the same choke. Every factor in our gun may vary the least trifle from any other gun of like make. However, when we have the gun we have the gun and it doesn't change any more except minor changes due to heat and cold. Some one load will fit that gun as well as it can be fitted and no other load will do so well.

Let us settle the matter of shotgun powders first before taking up cartridges or fitting a load to the gun. The normal breech pressure of a shotgun cartridge is from three to five tons, from six to ten thousand pounds of pressure per square inch. Contrast this with a rifle cartridge which affords a pressure of fifty-five thousand pounds, and it will be readily understood that shotgun powder must be the quickest, that it must burn freely under a far lighter pressure than any rifle except the small rim rifles. A shotgun powder is then far quicker than the run of rifle powders; neither is it so strong; that is, it develops less gas.

The burning pressure of shotgun powders might be given as seven thousand pounds with a flexibility of between five and ten thousand pounds. Pressures up to six tons are not considered dangerous in a well-built gun, with bulk smokeless. Dense smokeless powders are considered rather less flexible, and pressures should not exceed ten thousand pounds. Naturally the medium pressures are those to which the powders are best adapted, under which they burn in their normal time, in just so much of barrel length, with a regular pressure and even velocity shot after shot.

When pressures have dropped to the minimum, as with $2\frac{1}{2}$ drams of powder and an

ounce of shot, the cartridge is not a good one, and when they have approached the maximum pressure which the powder would tolerate, as $3\frac{1}{2}$ drams and an ounce and a quarter of shot, the cartridge is rarely a good one either. Might be some question about the three and a half cartridge, but if shot and powder are further increased, the rule is that more will be lost than gained. It is only when some means of reducing resistance has been found that we are enabled to use more than three and a half drams of powder and an ounce and a quarter of shot in a twelve bore. We will take this up by and by when we come to cartridges. However, we can here see reasons why the cartridge concerns would like to standardize their output, dropping such shells as less than three drams of powder and an ounce of shot, or more than three and a quarter drams and an ounce and an eighth. They know that in the average gun better results are to be had from standard loads of medium powder loads exactly adapted to the powders. That they give us loads other than these is because the demand is so insistent as not to be denied.

A good many of us have heard the statement made that it is not worth while to have shotgun barrels longer than 24 inches because a charge of smokeless powder is invariably consumed in that length of barrel or less. Some say the powder all burns in a barrel length of sixteen inches, some say eighteen inches, or twenty or twenty-four. Others maintain stoutly that the longer the barrel the higher the velocity. Who can answer definitely?

By way of settling this point as well as it could be settled, the ballistician Sweeley made a long series of experiments in which he fired some twelve hundred cartridges. His scheme was to take a number of guns, the barrels of which he cut to different lengths, beginning with ten inch barrels and running up to thirty-four inches, the barrel lengths increasing an inch to the gun, as 10 inches, eleven, twelve, and up to the longest. These barrels he suspended muzzle down over a steel tank filled with water, into which they were fired. By collecting the residue he could tell whether or not any powder had escaped from the muzzle unburned. He endeavored to use all makes of powders in use in this country, all kinds of wadding, and all loads issued by the factories,—also a great many of his own.

He found that with very light loads, say less than two and three quarter drams and $\frac{7}{8}$ ounce of shot, twelve bore, (all his experiments were with the 12) some of the powder would emerge from the muzzle unburned, even when using the 34 inch barrel. He reasoned of course that pressures and heat had dropped so low before the muzzle was reached that the powder would not have all burned anyhow, however long the barrel. He discovered that standard loads, as 3 drams of powder and $1\frac{7}{8}$ ounces of shot, all powder was consumed in about twenty-four inches of barrel length, and subsequent tests showed that while all the powder had been consumed in the length of barrel given, yet the gas continued its drive, and a 34 inch barrel showed a trifle greater

muzzle velocity than a thirty inch. Coming down he found that $3\frac{1}{2}$ drams of powder and $1\frac{1}{4}$ ounces of shot would burn all the powder clean in sixteen inches of barrel length, this with bulk smokeless powder. His heaviest loads with these powders was four drams and an ounce and a quarter, and he found that such a charge would result in all the powder being consumed in from twelve to fourteen inches of barrel length, some irregularity showing up. With dense smokeless, in such a load as the equivalent of four drams and $1\frac{1}{4}$ ounces, all powder was burnt in ten inches of barrel length. The reader must use his own judgment as to the value of these experiments; to me they seemed both conclusive and logical.

Sweeley reached a final conviction that for his own use he did not care to shoot less than three drams of powder and an ounce of shot, unless some means were found to add to resistance, thus governing the burning time of the powder. And with dense smokeless he did not care to use more than the equivalent of three and a half drams, this with but an ounce and an eighth of shot. Bulk smokeless would permit three and a half drams and $1\frac{1}{4}$ ounces, but if a more powerful load were used some means must be taken to reduce other resistance factors, as the wadding, cone, crimp and barrel diameter. In all this the loading factories and the powder makers will quite agree with him. The simplest kind of logic must tell us that if all of a big charge of powder is to be burned in ten or twelve inches at the breech that it is going to raise a devil of a heat and a devil of a breech pressure. We know what it will do to the shot charge, too, before its inertia has been fairly overcome. Few would expect good patterns under the conditions, and fewer yet would get them—except from a special gun. The ammunition factories cannot be expected to load cartridges for a special gun, and they are fully justified in seriously recommending standard loads only.

It is easy to prove that our shotgun powders have been made and regulated for standard pressures, running between three and five tons, that they will tolerate pressures between two and six tons, not much less and not much greater, and that the best results are to be had in medium pressures, that is, with standard loads. Such loads drive the shot charge at a muzzle velocity from 1250 to fourteen hundred feet ($3\frac{1}{2}$ drams $1\frac{1}{4}$ ounces) and many maintain that with small pellets it is not worth while to start the shot faster owing to air resistance which increases as the square of the velocity. We might start 8 shot a hundred feet a second faster than we now do, but little of this increased velocity would remain after fifty yards of travel. The factories know this and hence cannot see the horse sense of adding to breech pressure, pattern disturbance also, by way of gaining a velocity which cannot be held to the mark.

The above might be termed the factory argument, and it is a pretty good argument at that. If the maximum loads now furnished reach the maximum pressure which the pow-

ders will tolerate, not much more is to be said. Not much attention has been paid or will be paid to the man who through ignorance or recklessness is willing to exceed the pressure tolerance of his powder. Yet pressure tolerance combined with rate of burning has halted us, and kept us about where we are this many years. Plenty of us have been longing for progress, and some of us have hoped to see it come through the invention of a progressive burning powder. What we really wanted was not a higher pressure powder or one with a greater tolerance, but a powder which would drive a shot charge at a higher velocity, without increased breech pressure. We wanted a powder with a sustained pressure, sustained well toward the muzzle, as compared with any of the powders we had.

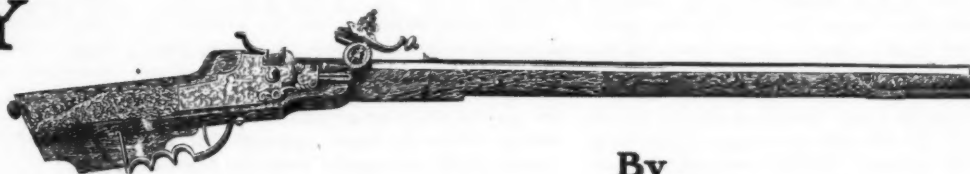
I suppose what people really had in the back of their heads was the old black powder qualities in smokeless form. They kept reading of the old days, some remembered them perhaps, when a man put just whatever load in his gun that he felt like standing up behind. The gauge of the gun didn't make so much difference; if the shooter felt like putting an ounce and a quarter of shot in his twenty bore muzzle loader, he put that much shot into it, and that settled it. Such a powder will never be had again. However, in course of time nitro powders will give us everything we had in black powder, in improved form. The difference is to be that we can't have everything in one powder but must select our compound in accordance with our needs.

Our present standard powders like Du Pont, Schultz, E. C. and the dense compounds will give us everything we ever had from black powder, with at the same time no smoke, lessened recoil, and a little sharper shooting; that is, higher velocity, in all loads from an ounce to an ounce and an eighth of shot or a trifle more in twelve bore, an ounce in sixteen and seven eighths of an ounce in twenty. No legitimate fault can be found with these powders, provided we do not overburden them, or mistreat them.

In progressive powders, like Du Pont T and Du Pont 93 we have compounds which begin where the standard powders leave off, that is, with an ounce and a quarter of shot in twelve bore. These powders are well adapted to an ounce and three-eighths in twelve, and as the Du Pont Company says, an ounce of shot or even more in the twenty bore. Indeed, in my personal experience in loading shells for the twelve, sixteen, twenty, twenty-eight and ten bore, I have found that shot charges and shot velocities are limited by other things rather than the powders. Not many of our twenty gauge guns, as now bored, will pattern well with more than an ounce of shot. Pressures are too severe upon the base of a long column of shot, and too many of the pellets are injured. If we could have shot materially harder than the hardest chilled, we could probably shoot an ounce and an eighth of shot in a twenty bore without breech pressure becoming dangerous, driving the shot at normal velocities, it is understood. Few will worry

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EVERY DAY BALLISTICS



By

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Ordnance Department U. S. Army

The Bullet's Flight in Air

Part II

HAVING gotten the bullet as far as the muzzle, we will now take up the force to which it is subject after it is thrown on its own, so to speak, in the cold, cold world. As it emerges from the muzzle it runs up against all sorts of difficulties, for it no sooner recovers from the final shove of the muzzle blast than old man gravity takes a hold and begins to pull it down or in other words it starts to fall. In addition, it encounters the resistance of the air and usually encounters some wind. All of this combined with the terrific spin given to the bullet by the rifle is enough to ruin the flight of the best of bullets.

While still in the barrel the bullet is given a sudden flip by the horizontal and vertical vibrations of the barrel. This flip is called jump and is really quite disconcerting. In the case of guns such as the Browning machine gun this jump is sometimes as great as one quarter of one degree, or nearly enough to throw the bullet to a range of 600 yards, even when the barrel is held on the level, providing the flip is upward.

It is readily seen that if the barrel is vibrating up when the bullet is leaving it will be thrown high, while if it is vibrating in any other direction the bullet will follow the direction of the jump.

The effect of the muzzle blast already referred to is to keep the bullet from retardation for a distance of about 25 feet after leaving the barrel.

The bullet actually has two motions as it issues from the muzzle, known as the velocity of rotation and the velocity of translation. The former is a spinning motion on its own axis, while the latter is a forward motion. Air friction starts slowing up both, but the rotation is little affected inasmuch as the time of flight is so short and the rotation so rapid.

Interesting things occur at the muzzle of the rifle before the bullet appears and also

afterwards. First, as soon as the charge is ignited and the bullet starts on its travel, there is a column of air pushed out of the muzzle. This air is highly compressed and therefore dense enough to act almost as a solid. Just before the bullet appears, the first traces of hot gases appear from gas leakage past the bullet. These gases have spiral form and are whirling, due to the rifling.

Finally the bullet appears, surrounded like Elijah's chariot in a blaze of fire. Within four or five feet of the muzzle the bullet probably reaches its highest velocity. In this connection the muzzle velocity is usually considered to be the highest velocity and is obtained by calculation from the instrumental velocity measured at some distance from the muzzle, and is based on the assumption that the velocity is nearly constant.

The bullet on leaving the muzzle is preceded also by a sound wave. This wave is soon penetrated by the bullet which passes it, although the sound wave would again catch up at a range of nearly 1500 yards if the bullet were allowed to go that far.

On leaving the barrel the bullet unsupported by the barrel is acted on by gravity and commences to drop. If it were only acted on by the propellant force it would continue on forever, like Tennyson's brook. Gravity is measured by the rapidity with which a body freely falling increases its velocity. This acceleration has been determined to be 32 feet per second. Of course when a body starts to fall its initial velocity is zero, but at the end of a second has a velocity of 32 feet, although it has only fallen 16 feet. At the end of the next second the body is falling at the speed of 64 feet per second, although it has only fallen a total of 48 feet during that second. The distance passed over in any second is always 32 feet more than it was in the preceding second.

The distance that the bullet drops in any

number of seconds is easily calculated by the formula $H = \frac{1}{2} GT^2$ or $16 T^2$, H being the distance in feet and T the time in seconds of falling. In three seconds the distance of falling would be (3^2) or nine times sixteen, or 144 feet.

As a consequence the answer to the old problem "which bullet will strike the ground first, one dropped at the muzzle or one fired from the gun both being at the same height and the barrel held horizontally" is: They will both strike at the same time, **PROVIDING** that the resistance of the air is neglected. It might be thought that the air resistance should affect both bullets the same amount, as both drop the same distance, but there is this ~~great~~ difference for the traveling bullet is romping through air which is very dense, due to the compression it is being subjected to.

The effect of gravity is to make the bullet describe a curve called a parabola, which is a bad sounding word but is perfectly harmless when it is understood that a base ball or a golf ball describe a similar path when in motion.

As a matter of fact the bullet does not describe a true parabola, as this only occurs in a vacuum, but on account of the resistance of the air the parabola is much fore shortened.

It might be well to describe in detail this air resistance and the phenomena which surround the traveling bullet. All bullets are subjected to very great resistance due to their displacing air in every direction as they travel. Bullets at high velocity meet a very high resistance, as at most velocities the resistance varies as the square of the velocity. The resistance can be reduced a great deal by proper design of the bullet so as to minimize the movement of the air.

Air resistance is very peculiar to say the least. At low velocities the resistance varies as the square of the velocity, while at high velocities it is less than the square. At about

the velocity of sound, *i. e.*, 1100 f. s., the resistance is extremely high, being as great as the fifth power. This is only for velocities around that of sound, however, and the change is very abrupt, much more so than standard resistance curves at the present time show it to be. Over a considerable range the general average is not far wrong when it is considered that the resistance varies as the square of the velocity. This is particularly true of heavy, slow-moving objects, and was long thought to be true of all projectiles. Later experiments showed the fallacy of this, but no published tests up to the present have shown the really rapid change upward in the resistance around 1100 foot seconds and the equally rapid drop afterwards. This is realized more keenly if it is recalled that it is at this velocity that the compression waves accompanying the bullet are formed as shown by photographs of moving bullets in air.

The retardation of the bullet is great. At the muzzle this retardation is so great that if it were continued for as long as a second the bullet would be completely stopped. But fortunately the retardation of the bullet diminishes very rapidly so that in less than one half second it has also diminished more than one half.

As the bullet travels it is accompanied by waves in the air formed by compression waves of different density. These waves travel at the velocity of sound, or perhaps it would be better to say that sound waves travel at the velocity of compression waves, as sound waves are compression waves. Therefore the angle between the bullet and the wave depends on the velocity of the bullet as the difference between the two velocities determine the angle.

There are two distinct waves in air accompanying the bullet. One from the forward portion of the bullet is the head wave, while the one from the base is called the tail wave. The velocity of the bullet can be determined from shadow pictures of the bullet in flight by the angle the wave lines form. The very point of the wave also depends upon the shape of the bullet, being different for sharp-pointed bullets from those bullets which are more rounded.

There has been much discussion regarding just what happens to these waves when the velocity of the bullet is decreased below that of sound. It has been contended that as the velocity falls off, and the angle of the wave lines increase, that at the velocity of sound they are traveling at the same velocity as sound and therefore are perpendicular to the bullet. By the same form of reasoning it is stated that as the bullet continues slower, the waves being faster, angle toward the front. How foolish this is can be seen from the analogy of the boat in water. Has any one ever seen the waves of a boat that are thrown up by its passing precede the boat which is the origin of the wave? As a matter of fact the waves as shown by the photographs disappear at the velocity of sound. This is natural enough as the wave to be created must have the bullet move faster than the wave

itself can travel. When this is not true, there is no wave accompanying the bullet but merely a flow of air.

Behind the moving bullet is a rarefied air space or vacuum if the bullet is moving much above the velocity of sound. This only occupies a distance of a fraction of an inch or so, and in the rear of this are heated air whirls. It is popularly supposed that this portion of the photograph shows the effect of boat tailing a bullet in reducing the vacuum, as these air whirls have a less diameter for a tapered base bullet than have the flat based eddies. That this is wrong can be shown from the fact that these air eddies only occur in this way at the higher velocities where elevation tests show both bullets to have the same great resistance. The real facts are that the maximum diameter of the bullet controls the vacuum and that the boat-tail owes its efficiency at the lower velocity because the air in closing around the bullet is less disturbed. In other words the shape of the stern of a boat for racing purposes would be unimportant if the boat could travel at speeds at all analogous to that of a bullet, because the bow would throw all the water entirely away from the rear and the shape of the stern would be immaterial as long as the boat did not slow up enough for the water to close. The same law holds for any medium and is certainly true of air plane struts which travel much slower than sound. Stated as a law it is that the shape of a bullet for maximum efficiency depends upon the velocity, high velocity requiring a sharp point and slow velocity a sharp base. Therefore since a bullet at the start is at high velocity and at the finish at a low velocity, it follows that it must have both a sharp point and sharp tail to be efficient ballistically.

Much has also been written about the so-called ballistic crack of the bullet in flight. It has been claimed that soldiers must be trained to distinguish this crack from the noise of discharge, otherwise they will be misled and expose themselves to rifle fire. Any one who has ever been on a range has noticed this phenomenon. It is very easy to tell the difference between the two, and it is not seen how any one with experience could be misled. The bullet crack which is due to the vacuum naturally disappears when the vacuum does, and this occurs at about 1200 yards range. By the time the bullet has reached 2000 yards the crack is a mere hiss, while the sound of discharge catches up and passes the bullet at about 1500 yards.

An interesting fact about the compression waves emanating from the point of the bullet is that it is used in some of the latest type of apparatus at the Aberdeen Proving ground to determine the velocity of the bullet at some of the shorter ranges. By this means the bullet is not touched or affected by passing through screens or wires, and other data such as accuracy groups can be obtained at the same time.

The effect of air resistance is to slow up the bullet so that the distance which it continues to pass over in a given time constantly

grows less. The path of the bullet is called the trajectory, which on account of the combined forces of the propellant, gravity, and the resistance of the air has the latter part more curved with the high point of flight nearer the point of fall than to the gun.

ANGLE OF DEPARTURE

As already shown, no part of the trajectory is a straight line, as the bullet continually falls as soon as unsupported by the barrel.

The bullet, of course, starts in prolongation of the center line of bore. This is true even of jump, or whip, because the center line of bore moves also and does not necessarily stay in the position it is in before the discharge of the gun. If, therefore, the bore is directed on the target (assuming there is no jump) the bullet will not strike the target, except at the shortest ranges, because it will hit below the point of the center line of bore the amount it has dropped.

For this reason, it is necessary to aim above the target the amount the bullet will drop in going the distance the target is from the gun. The sights are for no other purpose than to raise the center line of bore the proper distance above the target to counteract the drop and to obtain the proper direction.

The angle laid off by the sights is ordinarily called the angle of elevation, while the actual angle required for the bullet to travel to a given distance is the angle of departure. Neglecting jump and other variations, these angles are the same. In different guns the same type of ammunition at the same velocity will have a different elevation or sight setting, due to jump, etc., but the angle of departure will be the same in both guns.

This angle of departure is more misunderstood among riflemen than any other single phase, even among some of the renowned shots, who fail to get the foregoing distinction.

Assuming no jump when the sights are laid on the target for a given range, the center line of bore of the gun will be pointing at a point above the gun which is as much above the target as the point of strike of the bullet would be below the target if the gun were fired horizontally on a level with the target. The bullet never, under any considerations, rises above the center line of bore for, as has been shown, even where there is jump or crooked barrels the center line of bore at the very instant of discharge and the bullet's line of departure coincide, even though neither one occupy the place they did the instant before discharge.

DRIFT

In addition to the trajectory curve which takes place in a vertical plane to all practical purposes there is a horizontal curve in the bullet's flight. Of course, as a matter of fact both curves are taking place simultaneously, but it is simpler to consider them separately. The rifling which causes the bullet to rotate very rapidly being inclined to the axis of the bore tends to retard the bullet and thus reduce its initial velocity, due to this resistance. The velocity of this rotation at

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Velocity, Energy and Recoil

By Captain Edward C. Crossman

THIS sounds like taking in as much territory as that well known hobo who asked the lady for a drink because he was so hungry he didn't know where he was going to sleep that night. It isn't though, it is merely a little look into what effect is to be had from taking the Springfield out of the carbine class.

Every once in a while some inquiring person bobs up in the foolish-question-and-worse-answers department of the great political publication, *AMERICAN RIFLEMAN*, and wants to know what he gains by putting a longer barrel on his rifle outside of the chance to donate about twenty-five bucks more than it is worth to the Springfield Armory for making it.

I feel a kindred sympathy with this brand of I-want-to-know insect because I own several barrels longer than the 24 inches the original Ordnance Board settled on that time they wore all the varnish off the chairs designing the service rifle.

Yes, I know that 24 inches licked the world, including the owners and employees of the largest Swiss cheese factories in Switzerland, not to mention the British, who won't shoot us because we have so much better rifles, but who are now announcing that they are going to shrink their bulls-eyes and targets because of the high accuracy of their latest S M L E and the fact that some bird scored 69 out of 75 at the prodigious range of 1,000 yards—BUT:

I also remember that German Mausers in the hands of South Americans beat our service rifle and a Canadian rifle in the hands of a small handful of Canadian shots walked off with the three first places in our biggest long range match, and that both of them had 30 inch barrels, so just in the family let's cut out this eagle screaming so far as the gun goes and give a little credit for our wins to the ammunition makers.

It's a fine little gun, but we haven't any *lese majeste* laws yet concerning Ordnance Department productions.

I have the pleasure of owning a 32-inch barrel Springfield sporter, the barrel made for me at Springfield, a 30-inch barrel match rifle made in 1912, and 28-inch heavy barrel, one of two made at Springfield for Grove Wotkyns and me, and turned down to reasonable weight by the kindness of Major Whelen.

When I talk about a 32-inch sporter I can hear raucous laughter proceeding from the Concord Apartments, over on 17th Street, in Washington, D. C., but it arises purely from envy. The General's Wundhammer Springfield has only the 24-inch barrel and he'd give any two of his guns except that one to get my barrel on his fine stock.

I admit that I never tried the 24-inch barrel in the game of hunting Germans, but I have tried long barrels and short ones on most other sorts of hunting. The German hunting failed, I regret to say because the policy of

the Army was not to send over very fat ones because they were too easy to hit, and no thin ones because they could run too fast, and between the two rulings and for no other reason, France and I remained strangers.

The longer barrel, as I have pointed out, in addition to the slight improvement in ballistics, affords a much clearer front sight definition and lessens the penalty for front sight mis-alignment. From the target shooting standpoint the improvement in ballistics is important only in that it shortens flight time, and ergo wind effect, through its higher velocity.

The game shooter finds the improvement in muzzle and remaining energy increase, so far as ballistics are concerned, not to mention the greater steadiness of rifle shooting under the usual unfavorable conditions, including that touch of buck fever any man gets in front of big game unless he's too blase to get the full kick out of the hunt. Of course I've read all about Natty Bumppo, but the man whose pulse is not quickened by the chance to shoot at big game is not getting all there is out of the hunt. And quickening the pulse does not improve accuracy of holding.

At the time of one visit to Springfield they were testing the various lengths of Browning machine gun barrels, taking the velocities among other things. As the results will apply pretty well to the service rifle barrel, they may interest you. I have also set down the energies developed with the service cartridge, slide rule reading, so never mind the accuracy of the fourth figure in each one:

24-inch	2709 ft. secs.	2430 ft. lbs.
28 "	2776 "	2560 "
30 "	2833 "	2670 "
32 "	2848 "	2700 "

So we can get an increase of some 11 per cent striking energy at the muzzle, with our 32-inch barrel, other things being equal, a shorter flight time, and slightly flatter trajectory, although this is negligible.

The accommodating gentlemen in the Experimental Department, at my request, put a couple of Model 1917 rifles on the chronograph, as I had been curious to see what velocity they did develop. This rifle had 26 inch barrel, you remember.

With standard 2700 ft. ammunition, as shot in the Model 1903, the tale read:

Eddystone No. 1380604, mean of 5 shots, 2766 feet.

Remington No. 606558, mean of 5 shots, 2800 feet.

The mean of the two is slightly higher than that velocity obtained with a 28-inch Browning barrel, so if this is correct straight through the run of Model 1917 rifles, it would appear that with 24-inch barrel they should develop more than 2700 feet, because it is pretty well accepted that the velocity up to 30 inches increases at the rate of about 20 feet per second in the rifle if not in the somewhat sloppy-chambered machine gun barrel.

Long barrels, not appreciably greater in weight, develop slightly more recoil than shorter ones. Let's see how this figures out, retaining the same weight of 9 pounds through the figures for comparison.

Taking a standard formula for obtaining recoil, then we find a 9-pound Springfield 24-inch barrel, service cartridge, developing a rearward velocity of about 10.7 pounds; which is higher than the figure obtained by our own formula, but these are matters purely of comparison, which is true of most recoil measurement by theory as to effect of powder gases after bullet leaves the bore.

With 32-inch barrel, if our Browning figure of 2850 feet is obtained, then the recoil velocity of 11.6 feet is obtained, with the energy of 18 feet pounds, or in theory an increase of 11 per cent, following our increase in energy at the muzzle.

On the other hand, long barrel rifles are usually heavier unless the rifle is pared away in stock or barrel to offset the addition to the front end of the barrel, and this, together with the lessened muzzle blast, which is one of the items making up recoil, would make the entire difference unnoticeable.

One of the contributing factors to apparent recoil is noise and any lessening thereof is a reduction in apparent recoil because of the lessened nerve shock. Long barrels tend to decrease noise, both by removing the point of gas exit farther from the ears, and by slowing down the rate of gas exit through the lower muzzle pressure.

Many years ago I made a trip in one of our first airplanes to demonstrate something to the curious crowd of those days who attended airship exhibitions chiefly in the hopes of seeing some bird fall about one mile and a half, and then getting pieces of his plane or a little of his left ear to take home as a souvenir.

This something which was to be my stunt was the possibility of shooting a rifle out of an airplane and hitting things on the ground, which in those pre-war days was new and startling, inasmuch as the idea of staying up in the air at all was something worth paying four bits or a dollar to see, plus a long trip into the country.

So we went up in our old Gage Tractor plane with a couple of props overhead, driven by bicycle chains, while I sat in the cockpit forward of the pilot, and rested my elbows on the unobstructed edge so I could shoot down below. I wouldn't go up now in that darned old contraption for a dollar a second, but I had less sense—if any—in those days, and besides, didn't know what an airplane looked like when fairly safe.

We demonstrated that a rifle could be shot from a plane, because I shot two clips at a B target stuck up out on the field and hit the landscape each shot. That's all I did hit be-

(Concluded on page 15)



The American Rifleman

PUBLISHED SEMI-MONTHLY ON THE FIRST AND FIFTEENTH DAYS

By

THE NATIONAL RIFLE ASSOCIATION OF AMERICA

AT 1108 WOODWARD BUILDING, WASHINGTON, D. C.

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OF course you have read "Walter's Uncle Jim" in the December 1 number. Wasn't it a corking good, red-blooded story? One of the kind which convinces the reader that Carl Elmo Freeman knows his West and his Westerners. And did it strike you that "Walter's Uncle Jim" is more than interesting fiction; that from start to finish it is an incontrovertable answer to the anti-firearm reformer, who is now so perniciously active?

Walter's Uncle Jim

That Mr. Freeman chose the plot and setting of his story as he did, was not mere fortuitous coincidence. He proposed to and he succeeded, beyond question, in demonstrating the sound logic upon which rests the possession of firearms by reputable citizens and the misguided logic which is being used to bolster up the unsound untenable doctrine of disarmament by the proponents of Sullivan-type laws.

Turn to "Walter's Uncle Jim" and read it again. It is well worth while and you will be impressed by the 100 per cent Americanism of Lon Ferguson's reasoning:

"Well, we don't pack a gun to resist arrest or intimidate our neighbors. . . . The Bible tells us that not even Christ could handpick a dozen men without gettin' one skunk among 'em, and that we ought to turn the other cheek, and so on. But who wants to turn the other cheek to a skunk?"

The reputable Westerner who went armed did so in order to be able promptly and effectively to suppress the outlaw tribe of human skunk who infested the frontier towns and with whom the accredited officers of the law were too frequently unable to cope. Even the early West had law. What it lacked was order, which is the application of law. And when no law officer was present, reputable armed citizens applied the law.

True, that was the West of a Yesterday which has almost vanished. The promiscuous carrying of firearms is no longer the rule. Today even the rider of the ranges — no longer a dashing figure in Stetson, neckerchief and chaps but rather a sublimated farm hand in overalls — if he carries a gun at all uses it, save in exceptional instances, only on side-winders and other "varmints." The traditional *mallo Hombre*, thanks to Colonel Colt, has gone the way of the buffalo.

Yet when a survival of the wild, bad days, such as is narrated by Mr. Freeman, does occur there is usually in the general vicinity some he-man like Lon Ferguson who does

not shirk the duty of rendering the skunk incapable of further harm, which is most effectively accomplished with a bullet.

* * * * *

WHILE the "Wild and Woolly" with its border town holdups, powder-burning brawls and tragic "Boot Hills" has been sinking below the Western horizon, a criminal reign of terror of even greater violence has been rising in the East. Killings which would have been beneath even the depravity of Billy-the-Kid are of almost daily occurrence. Banditry, which has reached the perfection of a profession, flourishes unhindered. All the crime of the old bad West is there in a new and far more menacing guise.

The analogy between the two conditions is plain. What difference there is, lies squarely in the fact that the citizens of the Old West were encouraged to line up and fight on the side of law and order, using, legitimately, the same weapon which was put by the bravo to illegal use, in which policy the ultimate solution was found; while the law abiding citizen of the East today must disarm himself or appear, under the Sullivan type law, to little better advantage than the thug.


The answer is too obvious to need further comment.

* * * * *

ALONG with Lon Ferguson's logic, we commend the editorial by Allyn Tedmon on the opposite page. Mr. Tedmon is also of the West, Western, and again, peculiarly enough, in his discussion, as in Mr. Freeman's story both the handgun and the automobile, figure as accessories to crime. Mr. Tedmon is quite right in feeling that the time is rapidly coming when the press of the country will approach the firearms question more intelligently. In the early days of the anti-firearm campaign the voice of the reformer was heard above all else and his utterances, largely uncontradicted, carried certain weight.

But since one hundred per cent Americans throughout the country have taken a stand against Sullivan type legislation newspapers are beginning to realize that there are two sides to the question, and a few are lining up strongly against the paid reformers' latest panacea. May their tribe increase!

Like the West of Yesterday, the East of today has its Law. Like the early West, it lacks order. The application of the Law is not always possible in coping with rapidly increasing and widely distributed crime. What the East needs today is an armed "white American" citizenry who in the absence of accredited officials can and will—ACT FOR THE LAW.



The Shooters' Magazine

Editors

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IT is seldom that a just cause is lost. A cause that is just is fundamentally right and we may have confidence that, in the end, the people will inevitably recognize fundamental worth. Thus are all things made possible in this great country of ours.

There has been food for much thought in the activities of the anti-firearm movement which has been disturbing the country for the past few years. Much has been written about it; more has been said, pro and con, yet I, for one, have felt that the press of the nation in general had determined to pursue a hands-off policy, if not to be, in fact, secretly in favor of the movement.

However after reading over the last, December 1st, issue of the Literary Digest I am certainly delighted to see that in the ranks of our many editors there are some at least who are seeing the truth and are not afraid to print it.

On page 14 is an article titled "New York, The Gunman's Paradise." The review relates that from January 1st to the time of writing the crooks and gunmen have "bullied" New Yorkers "out of something under three million dollars." It then gives figures from other cities by way of comparison and at last refers to the recent double murder of bank messengers by crooks. Then the fire works start, because they quote the following from the Jacksonville, Florida, Times-Union whose editor says:

"But we do not believe a robbery of this kind could be committed safely in the busiest part of Jacksonville or of the average city of the United States. The two bank messengers who had this money were armed by special permission, but among the thousands who saw the crime perpetrated there was probably not a man prepared to do anything to uphold the law by resisting the murderers. It is conceivable that men might have committed this crime in Jacksonville or in the average American city and have gotten away with the booty, but it is much more probable that, among the thousands who saw the crime or the flight, some man in sympathy with the law would have been armed and would have acted for the law."

How could one condemn the Sullivan law more strongly? What more could be said to damn to perdition those who insist on foisting upon us more of the same variety?

Truth is Mighty and Shall Prevail

By Allyn H. Tedmon

An Editorial for White Americans

An editor who dares speak the truth, a real American.

Then later on after a review of the brutal murder of two brave men and the absolute escape of the made-safe-by-law-crooks, a passage from the New York World is quoted in which it is stated that the automobile is greatly to blame for the many crimes. The Digest then adds the following:

"After all, what percentage of automobiles is used as an aid to crime," asks The Daily News. A legitimate article can not be condemned because it is put to an illegitimate use, avers this paper, adding, 'It is not the automobile, but the one-hand gun which should receive attention. The robbers were not armed with automobiles; they did not murder their victims with gasoline; they perpetrated the hold-ups and committed the murders with guns. We need laws prohibiting the sale and manufacture of revolvers. As a civilian's weapon, it ought to be forever outlawed.'

"This point of view" continues the Digest "it is interesting to note, is opposed to that of the Jacksonville paper quoted earlier, as well as of many authorities on crime. Such laws, as a matter of fact, 'are far more easily enforced against good citizens than bad, and it is unlikely that the latter group will ever be disarmed,' admits the New York Times. That the city's police force should be increased is this paper's suggestion, coupled with immediate trial and adequate punishment of the highwaymen when captured."

Here we have before us the written messages to the people of three different editors of three different papers. Two of the three are men. The other one is an enemy to the people and should not be in place to wield an editorial pen.

Public opinion is often moulded by the editorials of the press. When a people of a certain city are forced to read such doctrines as this, there can be no reason or doubt that we shall continue to have misguided men and women clamoring for an anti-gun law. But let us go further and question what the editor has said. It is not the auto but the "one-hand gun" which should be outlawed, yet while they did not

"Some man in sympathy with the law would have been armed and would have acted for the law." Read it again. A red blooded man wrote that, a real He-Man, a loyal citizen of these United States of ours, a man we are and should be proud of.

kill their victims with gasoline, they certainly did escape in an auto and certain is it that the auto had just as much to do with the completion of the crime as the gun.

You see the editor owns an auto but probably never has owned a gun. It is hard to down your subconscious self. He again demands laws to prohibit the manufacture and sale as though guns were not "a legitimate article, put to an illegitimate use." Yet when we again read what that man from Jacksonville said we can only pity another male of the species in the same responsible position, who has lost his fighting edge if he ever had it. For Heavens sake! who in the world does this editor of the Daily News Expect to enforce his proposed laws? Certainly *he* wouldn't and yet he wants to disarm all others so they couldn't.

But while his arguments must be answered for the good of the cause yet they are so preposterous and absolutely hopeless of results, as proven by the Sullivan law and all others like it, that we begrudge the time and ink necessary. But let us take hope and square ourselves again, for we are winning. Here we have two editors out of three who see the folly and who will be hard men to change. The press is a power and when used in the right can do great good, but when allowed to drift can do untold harm.

How does your local editor stand? Our editor here is a *nice* fellow but so far has failed to run a line. The city of Denver seems to be blessed (?) with the same kind of men, at least they too have failed to take a side. Cannot we help this situation? It seems to me that we can, and at least we can tell this Jacksonville editor that we are for him. Lets write him.

Groups, Normal and Otherwise

(Concluded from page 3)

that if the first shot is the 6 o'clock shot of the normal group and strikes in the upper half of the bullseye, while the second shot is the 12 o'clock shot of the normal group, it must infallibly go over the target with several inches to spare. The same in reverse for the lower half.

The moral the writer has drawn for himself from the above reads something like this: "Fire your first shot and second shot with the *greatest* of care—and any succeeding shots until you arrive at about the dispersion of your *normal* average group, for until then you do not know exactly where that group lies. Study carefully each shot with relation to a normal group; to what part of this group does it belong? Always be anticipating the next bullet-strike—if you have plotted in the greater part of your normal group, it is safe that nine out of ten times, the next shot will go into vacant space; is that where you want it to go? (See tenth shot, Fig. 2).

Two questions follow, which, if the reader can answer, will not only prove his understanding of the above rambling remarks, but

will assure him points on the target range and then some more points.

(a). If your first shot is a "wart" four at three o'clock and you have taken one-half point left windage, why may your next shot be a nipper five almost on top of the first one?

(b). If your first shot is a nipper five at three o'clock and you have taken one-half point left windage, why may your next shot be a four at nine o'clock?

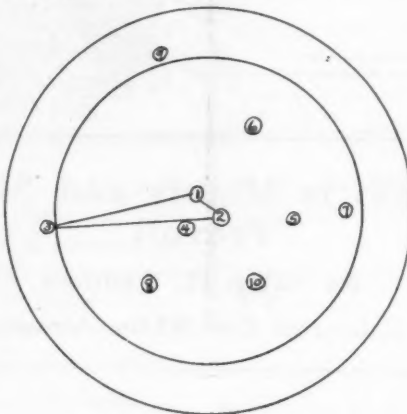


Fig. 4

If you cannot answer these, draw yourself a normal group of five shots the width of the bullseye, and in (a) assume that your first shot was the nine o'clock one of the group, your second the three o'clock one. See? Now reverse these two shots for (b).

One further remark, some seasoned shooter will promptly arise and remark that *ALL* shots must be fired with the "greatest of care." "Guilty!" but after several years of working with men, the writer would insist that only

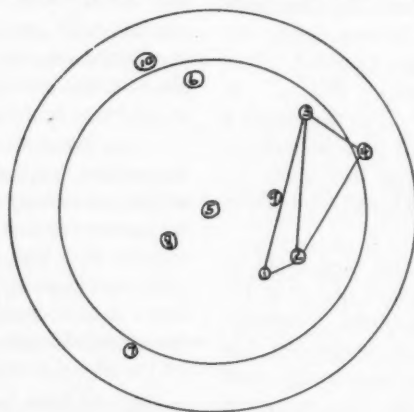


Fig. 5

the exceptional men, without *exceptional* effort, can maintain the care and uniformity necessary to properly locate his group for more than two or three shots. Many of us have eyes that are no longer young, and that tire rapidly. To such men, the *AVERAGE* men, the above remark was addressed. And further, when S. S. above mentioned thinks he can shoot a group smaller than the bullseye at 600 or 1000, let him go out on the finest, fairest day he can find, run up the

target in question and just assuring himself that he is somewhere near the middle of the target, fire ten shots *WITHOUT ANY BEING MARKED*. Then repair to the pit and measure the circle necessary to hold those ten shots. A few, *VERY* few, will be satisfied with the results.

Remington Game Loads

By Chas. Askins

IT seems strange that none of our ballistic authorities takes the trouble to work up a good bullet and smokeless load for the cartridges of a certain kind, say, the Heavy Duck Load, with a certain size of shot, are loaded to a prescribed velocity. This velocity might be 975 feet over a forty-yard course (about a normal velocity), or it might be less, but the velocity having been determined or fixed, all cartridges of this brand and shot size are loaded to that velocity. The powder may be Du Pont, Dead Shot, Ballistite, E. C. or what not, but the velocity will be the same regardless of the brand of powder, and I might add regardless of the amount of powder used.

Loading to velocity and pressures has always been more or less in vogue by arms and ammunition companies, but the Remington Company is making a special effort in Game Loads to comply with the greatest exactness to one standard velocity. In these cartridges nobody knows the brand of powder, nobody knows the quantity of powder, nobody knows the breech pressure, nobody is told the exact amount of shot, but everybody should know that all of these cartridges have like velocity, that if one shell will kill at a given range the next shell will kill at like range, that if a certain lead is found correct for a certain fowl at a given distance, that lead will always be correct and never need be changed, so far as speed of load is concerned. In Game Loads we have one feature that wing-shots have always considered highly desirable—a fixed velocity, permitting a fixed lead.

The .22 W. C. F.

By C. A. Bramble

SOME shooters may not understand the principle governing the manufacture of Remington Game Loads. All of these .22 W. C. F. I have one of these rifles, and in some respects I think it an excellent arm, but the bullet is a brute and with the heavy charge of black powder that I use the fouling makes it inaccurate after five rounds or so. But if it had a sharp-pointed bullet, possibly a little heavier than the present bullet and a suitable charge of some smokeless powder that would not ruin the barrel in a season's shooting, I believe we should have a capital little rifle to keep around camp. Its excess of powder over the .22 Long Rifle would compensate for a slight loss of accuracy. Here is where the experimentalist and target shot could help his less scientific brother of the bush.

Target Shooting in Schools

(Continued from page 6)

Three variations of an easily assumed sitting position are shown in Figs. 25, 26, and 27.

In the positions illustrated above, the shooter sits facing the right front (the target being in front), feet (as in Figure 25) well apart, or locked together with left heel in right instep (as in Figure 26), or legs crossed (as in Figure 27), left leg over the right. The elbows are supported inside the knees. The sling is adjusted as in the prone position. Unless the knee and thigh joint are very stiff, there will be noticed in all of these positions a tendency of the knees to sag under the pressure of the elbows against them; in other words, the knees can be supported only by pronounced muscular effort, which of course produces unsteadiness.

A few shooters of short, thick physique, with long arms, find the position illustrated in Figure 28 to be very steady.

Here the right leg is crossed over the left, and the legs are drawn up close to the body, points of elbows resting on points of knees. This is an excellent position for those to whom it is adapted, but there are very few in this class, since an abnormally short body and long arms are required for comfort in the position.

The best sitting position, but generally the most difficult of all positions for the beginner to assume, is that pictured in Figs. 29 and 30.

In this position the shooter sits facing the front, left shin crossed over and supported by the sole of the right shoe, legs extended well



Fig. 25—High Sitting Position, Feet Apart

tion. The correctly assumed position involves little muscular strain and offers a firm support for the left elbow and upper arm.

The beginner will find that in this position he will at first suffer more or less acute strain in his hip joints, and perhaps in his back, but this is merely a temporary matter and will wear off as soon as a little practice has resulted in a stretching out of the ligaments and tendons involved. When the stretching out process has taken place, slight strain of any sort will remain, and the position will become very steady.

Description of the firing positions has here been concluded. In respect to all of them it may be said that after the details of form have been mastered, practice is the important factor in improvement. Since in

all of the positions muscular control and development of various kinds largely govern the success of firing, a great deal of aiming and trigger squeezing drill in carefully assumed positions is urged upon young shooters who are after the best possible results. Great care should be taken not to aim about promiscuously, but to aim and snap only at targets or some object which could not be damaged by an unexpected accidental discharge. While this sort of practice has not the fascination of actual firing, the shooter who takes advantage of it will greatly accelerate his progress.

Velocity, Energy and Recoil

(Concluded from page 11)

cause between the pitching of the plane, and the vibration my front sight waltzed through gyration enough to take in the most of the Perry thousand-yard butt. However, a little thing like this didn't discourage my faithful assistant from the rifle club, because after he had visited the target and inspected it, the delighted crowd found about seven bullet holes through it—strange to say, made by one bullet still in the pocket of said assistant. You see, he'd returned to qualify riflemen in the militia.

The point of my story is—as you'll doubtless like to know, if there is any—that the roar of the engine back of me totally killed the report of the rifle, whereupon the rifle, a 7½-pound sporting Springfield, quit kicking. After the first shot I had to open the bolt to make myself believe that I had fired the shot. After a while the comeback reappeared in a minor form, but never the nerve shock of the recoil plus the report. Some of this was due to novel position, and nerves already blunted in perception by the infernal blasting racket of that engine back of me, but much was due to removing that ear-straining blast of sound which you know will follow the pressing of the trigger.

Where one does feel the increase of recoil by a change in the rifle is when it is much lightened, not to mention shortened.

Drop the weight of the rifle to 7 pounds, including everything the recoil has to move, such as sling and sights, and you get a recoil velocity of about 13.7 feet per second, and an energy of 21 foot pounds, or an increase in recoil energy of nearly 30 per cent. Some of this is not noticed if the rifle is restocked in more comfortable form than the old stock.



Fig. 26—High Sitting Position, Feet Locked

away from the body. The knees are permitted to sag down so that no effort is required to hold them in place. The left elbow and upper arm rest along the upper part of the left shin, having a large surface of support, and the right elbow rests on the right shin, just below the knee. If the shooter's joints are very limber, his knees are likely to be forced so low that he must bend his back like a contortionist to get his elbows down where they should be; but if his joints are thus so limber, his back is likely to be very limber also, and he will be able to bend it to the required posi-

In Reply to Mr. Fry

By Roy C. McHenry

FOR quite a number of years I have been reading interesting articles on percussion revolvers and their performances, contributed by Mr. Henry Walter Fry to this magazine and *Outdoor Life*, and therefore I was mighty pleased to have him come out in print in the November 15 number of the *AMERICAN RIFLEMAN* in response to my *Hand-Gun History*, even if he did take a wallop at some of my statements in passing.

By this time I presume that Mr. Fry has seen the October, 1923, issue of *Outdoor Life*, which contains an article by Miss Adelaide Wayland, about a collection of pistols owned by Mr. C. Burton Sauders, of Berryville, Arkansas. On page 257 of the magazine is a picture of two Walker Pistols and a Texas Colt. The Walkers, according to the text, have nine-inch barrels and are in perfect condition. The illustration is a trifle small to show details, but apparently they have the hook arrangement to hold the loading lever against the barrel.

Now about the two .31 Colts which I called respectively pocket and belt guns of the 1851 Model. Unfortunately I didn't have any ancient Colt catalogs to fall back upon, so I followed the classification given by Mr. Stephen Van Rensselaer in his catalogs, in which he describes the .31's as belt revolvers when they have a barrel length of five inches or better. It strikes me as pretty reasonable that men in 1840 would carry a five or six inch barreled gun in a belt or belt holster unless the pockets in those days were a whole lot different than they are now, although it is possible that they followed the custom prevalent in some of the southern mountain districts, of packing them in the pocket, butt down and barrel up.

The serial numbers on the two offending .31's are both way up in the two hundred thousands, and they have the little wheel on the hammer, bearing on the mainspring, which Mr. Sawyer, in his *Firearms in American History*, Volume 2, page 65 says wasn't put on until after 1849. Also, they are the "spittin' images" of the 1851 Navy Colt, so called .36, only on a slightly smaller scale. That's why I termed them 1851 Model. They may be forty-niners, but I'll bet they were born a good deal closer to 1860, for most of the Civil War officers on both sides carried them.

I haven't any very good alibi on saying the Navy Colt bullet weighed 170 grains. I reckon that the slip was made when I momentarily abandoned the "Pick & Hunt" system on which I operate my typewriter, for the touch system, which I only know by hearsay, and whacked the 7 when I should have hit the 4. I have quite a vivid recollection of weighing

one of those bullets on a ruler and a knife blade, with a 150 grain Springfield '60 bullet as a counter-weight, which was the nearest approach to a Modern-Bond scale that I had in my equipment, and finding that the Springfield bullet overbalanced the lead bullet just a trifle.

Mr. Fry is right that the caliber of the Navy Colt was nearer a .38 than a .36. I mentioned in describing it as being larger than any of the present .38 cartridges except the 38-40. I would be interested to know how his converted .36 performed with the .41 long cartridges with their 195 grain bullets. The other day I got hold of a Navy revolver, 1861 Model, .37 plus in caliber, which has been converted to take a center-fire cartridge.



A Pair of Deringer Pocket Pistols.

It is quite similar to the one shown on page 9 of the September 15 number of the *AMERICAN RIFLEMAN*, No. 3 on the plate, except that it has a round barrel instead of an octagonal one, and has the same type of ejector. I can push a .38 long Colt cartridge down the muzzle past the end of the shell, and it fits the chambers very loosely, too loosely for safety, according to my way of thinking. Some of these days I'll get a batch of .41's and try it out.

The manufacturers of the percussion revolvers weren't any more careful about specifying the calibers of their guns closely than they are now, but instead of skimping on the bore, they threw in a little for good measure. The .36 was about a real .38, and the Colt and Remington .44 army revolvers actually used an oversize .45 bullet.

Speaking of Remingtons, if I could make a date with Mr. Fry, I have a pair of the big fellows that I'd like to try out with him, using his non-fouling, greased felt wads. They are practically in factory new condition, and last

Fourth of July, when the cops were all busy downtown, I set up a twenty-five yard range in my back yard, loaded one of them with as much FFG as I could crowd in and seat the grease-smeared pointed bullets, breathed a little prayer to Allah and let 'er go. I didn't have a single missfire out of the whole six chambers, and from the acoustic standpoint the experiment was a wonderful success. I scared the neighbors for blocks around, although they are pretty well broken to gunfire of the ordinary sort. The disappointing part of the job was the condition of the target, which was identically the same, before and after taking. Then I tried out my Navy Colt, the one which appears in the illustration. That behaved a trifle better, for I put two bullets into the target, up in the north-west corner. I may say for myself, in extenuation, that my cartridge hand-guns act much better than that, even my soft coal burning .45 Colt Peace-maker, when I put them through their paces.

There were two types of single action caps and ball revolvers made by Allen & Wheelock, both of which had rammers operated by movable trigger guards. The earlier model, of whose existence Mr. Fry seems to be somewhat skeptical, had a cylinder pin which inserted at the rear, and a side hammer. I had no specimen of it to photograph, but it is shown in Mr. Sawyer's *Firearms in American History*, Volume II, Plate 5, No. 13, opposite page 77, and is described on page 82. The external appearance reminds one of the 1855 Colt. The later type was a center hammer gun, and the cylinder pin inserted at the front. In general appearance it is a dead ringer for the rimfire cartridge revolver which the firm produced to shoot the .44 Henry cartridge. The latter is shown in the illustration of my article in the September 15 number of the *AMERICAN*

RIFLEMAN at page 9. In the cartridge model the rammer becomes an ejector, and the only changes are a bored through cylinder in place of the cap kind, and a hinged loading gate. It was a strong well-made gun, but rather badly balanced on account of the excess metal below the barrel, just in front of the cylinder.

The Starr single-action, which Mr. Fry refers to, and its companion, the double-action, which I showed on page 9 of the September 1 issue, are extremely well made and have one very desirable feature. The frame is hinged and breaks up like the Smith & Wesson Russian Model, permitting the removal of the cylinder. The two guns, however, are the most unhandy things in the pistol line, excepting, perhaps the rat-tail Circassian flintlocks, that I have ever seen. You can't get a firm hold on one of them. In Miss Wayland's article in *Outdoor Life*, a double-action Starr .44 is shown and described as "Jesse James' long range gun." If it really was, I can understand why he embraced a criminal career, for the hand slitting grip of a Starr is

enough to ruin the disposition of any man.

In the opening number of my *Hand-Gun History*, some of you may remember that I discoursed at length upon the Deringer pistols. I can't resist the temptation to put in a picture of a pair that I acquired after the article went to print. They aren't of the watch charm size that Mr. Deringer made up out of his own head, as therein set forth, but are a little larger, though still small enough to fit comfortably into a man's pockets. The barrels are four inches long, flattened on top to facilitate sighting. The bores are about a .46, as near as I can judge without putting a micrometer on them, and the grooves are six in number and rather deep. I have dug up a round ball mold that fits them, and one of these days I'm going to try them out.

When I was writing the article I forgot to tell about a very useful improvement that the western gunsmiths apply to the Colt single-action, alias Peacemaker, Frontier and Army Model. It consists of filing the notch on the hammer so that it can be let down from the half cock. "Where's the improvement?" some of you will ask. Well, you know that with the single-action as supplied by the manufacturers, you have to carry the gun with the hammer on an empty chamber, as the "safety" notch leaves a little too much of the hammer point exposed to make it really safe. Observe, then: With the cylinder freed as at half-cock, you can let the hammer down until it rests between the heads of two cartridges, out of harm's way, and you carry six loads in the chambers instead of five. Any jackleg gunsmith can fix it up for you, although they won't stand for such a job at the factory. If you try it out, mind you have a firm grip on the hammer when you let it down and that the firing pin comes between the cartridge heads, for there is just room enough for it.

And while I am talking about old Peacemaker let me tell you of another trick your old Westerner used to do to this gun. You all know of the value of a properly lightened trigger pull, but to your gun-fighter of the 70's a lightened hammer throw was of far more importance. Take your old single action out and notice how hard it cocks. Mr. Bad Man cut his "fighting time" down a fraction of a second by draw-filing the mainspring until the gun cocked with quite less effort.

When I finished up the *Hand-Gun History*, I explained that Major Hatcher was going to write up "Modern Hand-Guns," and consequently I stopped my discourse without discussing the types that are being made today. Very recently, however, I learned that the Major wasn't going to publish his article just yet awhile, and he followed it up with a full and complete dispensation to go on with my yarn as far as I like. So some of these days, if the editors will stand for it, I'll try to bring it down to date.

A New Department

By Capt. Jerome Clark

ARMS collectors of this country, for many years have felt the need of a publication which would afford them an opportunity for the discussion of subjects of interest to them and the exchange of information pertaining to their particular field; and what is also quite as important to the enthusiastic collector, a clearing house for the trade, purchase, and sale of specimens. To date only two attempts have been made to supply this need. Although excellent in their time, the magazine of "Antique Firearms," published a few years ago by G. Elsworth Brown at Athens, Tennessee, and later "Stock and Steel," edited by F. T. Dexter, at Marshalltown, Iowa, each of which was particularly a fire arms' collector organ, were both short lived. This probably was due to the fact that at the start they did not have the benefit of an established circulation and as they were of interest only to collectors, it was not possible to support them by sufficient subscribers to insure permanence.



One of the rare Collier revolvers, a pair of which were recently discovered in Tasmania

Beginning with the issue of January 1, 1924, there will be included in the contents of "THE AMERICAN RIFLEMAN" a separate department devoted exclusively to the fire arms' collector and students of fire arm history and their needs. If this department receives the support which it deserves its possibilities as a common meeting ground will prove a great boon to our fraternity.

It may not be generally known, but it is no less a fact that there are hundreds of collectors in this country who own many most creditable pieces yet but are entirely unknown to the brotherhood.

There are two types of collectors. The first class is comprised of the type of men who are trying to scrape up as many pieces of junk as is possible without any idea except the possession of numbers of pieces. This class is hopeless and we neither expect any information from them nor do we care to cater to them.

(Concluded on page 18)

A Century Old Revolver

By Henry W. Fry

THERE are many worthy people, especially in this country, who believe that the revolver was solely invented by Colonel Samuel Colt. As a matter of fact, however, the principle of having a revolving cylinder holding several spare charges was tried, but without any great success, centuries before the gallant Colonel was born or thought of. There is in the Tower of London a revolving gun dating back to the time of King Henry VIII, four hundred years ago. Colonel Colt certainly did not invent the principle and never claimed to have done so, though he deserves all the credit we can accord to him for the energy, foresight and perseverance which enabled him to develop the principle and make the revolver the practical and formidable weapon that in his manufacture it became.

In his interesting article on *Hand-Gun History*, Mr. McHenry describes the revolver invented and made by Elisha Collier a little more than a hundred years ago. These weapons are now very rare, and that they are greatly prized by collectors is shown by the fact that one of them, sold at public auction in New York recently, fetched no less than \$460.00.

And now from far off Tasmania, a little island lying just off the bottom end of Australia, a friend sends me two photos of one of these old time guns, a pair of which is in the possession of one of the public officials of the town of Launceston, a place of about twenty thousand inhabitants in the northern end of the island.

The Collier revolver is a five-chambered flintlock, of about .45 caliber, with about a six-inch barrel and the cylinder made to revolve by hand. As will be seen, the ramrod of this particular specimen is missing.

The weak point about the Collier is that though a multi-shot, it is not a rapid fire arm, for the simple reason that when one shot has been fired it is not possible to fire another till the pan of the lock has been primed with fresh powder from the shooter's flask. In actual fighting this delay of course would be fatal. A man with a pair of ordinary double-barreled pistols, such as are still preferred by the back country folks in Brazil, would be an opponent against which a man with a Collier would have very little chance unless he had made his first shot a fatal one. It was not till the invention of the percussion cap that revolvers, breechloading, magazine and automatic firearms were made practical. Till that simple little device was perfected the science of gunmaking had made practically no progress at all for nearly two hundred years.

Every Day Ballistics

(Continued from page 10)

the muzzle depends in turn upon the velocity of the bullet and the distance it travels down the bore in order to complete one revolution. For the service rifle this rotation is the velocity in inches per second divided by turns in inches, or 2700 times 12 divided by 10, or nearly 200,000 rotations per minute.

The effect of this rotation is two-fold:

First, it keeps the bullet point on by its gyroscopic or spinning top effect.

Second, it causes the bullet to curve laterally in flight. This curve is called drift and is the combined effect of the resistance of the air, the rotation of the bullet, and the effect of gravity. Just exactly how this curve is produced is accounted for in different ways by various authorities. It probably occurs for the following reasons:

In the first place the bullet drifts in the same direction that the rifling turns. In a right-hand twist barrel such as the service rifle the drift is to the right. When the bullet leaves the barrel and encounters the resistance of the air and the pull of gravity it starts to drop under the latter force and therefore has a slightly greater pressure on the under side of the forward portion of the point than it has in any other place. This results in a push or upward force on the under side of the point which on account of the bullet spinning like a top causes the point to swing to the right just as a top which in spinning resists force applied in a right angle if pushed. In other words a spinning object resists force applied in a given direction by moving at right angles to the force instead of giving way before it.

As the bullet begins to drop more and more under the influence of gravity, the point becomes deflected more and more so that the greater the range the greater this deflection becomes. And this motion is materially assisted by the increased air effect on the side of the bullet once it becomes turned so that the drift at the longer ranges, where the time of flight is so much greater, becomes excessive.

There is a vast difference in principle and effect between the curve of the bullet and the curve of a round ball such as a baseball or golf ball. For a right hand rotation the result is a curve opposite in direction in the case of the round balls. A recent syndicated article on base ball in the daily press was to the effect that the original idea for curving a base ball was secured by an enterprising youth curving clam shells while throwing across a river, and that even science could offer no reason as to why a base ball curved. Outside of the fact that all text books on ballistics since the time of Benjamin Robins, who antedated base ball by over a century, give a logical explanation of this perfectly natural event, the press statement is incorrect. The trouble with sport writers is that they confine their historical investigations to text books written by athletes and not to the writings of ballisticians and physicists. Robins proved by actual experiments the fact of a rotating ball curving and showed the rea-

son therefor, *i. e.*, the increased density of air on the forward portion of the sphere in the direction of rotation thus forcing the ball in the same direction as rotation, where the resistance is least due to less air density.

A rotating ball will always curve in air regardless of which way its motion is directed, for instance, straight up or down. Also its axis is invariably perpendicular to the path of flight while the axis of a bullet is parallel to the path of flight. A bullet being elongated curves from an entirely different reason as has been shown and will not curve, if fired up or down due to the fact that gravity combined with air resistance are acting so as to coincide or be parallel instead of being perpendicular to each other as in normal flight at low elevations.

A very peculiar and paradoxical thing about drift is that a wind blowing in the same direction as drift, decreases the amount of drift while in the case of a wind blowing in the opposite direction and which would normally be thought to decrease the amount in reality increases it. This is because in the case of a right wind and a right rotation of the bullet the wind causes the point to rise while the left wind makes it droop.

The effect of the wind in these cases with reference to drift must not be confused with the amount the wind actually blows the bullet which if there were a considerable wind would entirely overcome the effect of drift and render it negligible. As a matter of fact drift can hardly be measured at the shorter ranges.

EFFECT OF DENSITY AND HUMIDITY OF THE AIR ON THE TRAJECTORY

Air resistance depends directly on air density. Aside from altitude effects density is dependent upon temperature, pressure and moisture. At increased altitude if the temperature remains the same the density decreases and the range therefore increases. Therefore the sights must also be changed.

Ordinarily the changes in pressure can not be corrected for in rifle shooting as other errors are larger. Temperature changes however are so great that some attention must be paid to them. As the temperature of the air increases the density decreases which in turn decreases resistance and increases range. Dampness in the air increases the ballistic coefficient of the bullet or in other words makes it possible for the bullet to slip through the air easier. On wet days therefore the elevation can be lowered while on dry days if not too hot it must be raised.

THE EFFECT OF WIND

We now come to the most important factor of all and that is the effect of wind on the flight of the bullet. Wind of course affects both elevation and deflection.

A wind from ahead will of course affect the bullet by increasing the resistance of the air and therefore decreasing the range with a given elevation. On the contrary a rear wind will decrease the air resistance thereby increasing the range of the bullet. A wind from the right will blow the bullet to the left an amount depending upon the weight of the

bullet and the time it is in flight. These are the important factors although the shape of the bullet has some influence. Generally speaking those bullets which are so called good wind buckers are in reality shaped so as to decrease the resistance of the air. This will cut down the time of flight and give the wind less time to act. Such a bullet is the boat tailed bullet.

Winds are however rarely if ever straight ahead or directly from the flank and as a consequence a given wind will usually affect the bullet both in elevation and deflection. For example a wind nearly dead ahead say one o'clock will exert nearly its full force in stopping the bullet with but half of its force available for lateral deviation. On the other hand let the wind shift to two o'clock and the reverse will be true that is seven-eighths of its force will be side ways and only about one half retarding. Perhaps a better way to state this would be that a two o'clock wind has the same effect on the bullet as a wind of one half its force acting ahead and a wind of seven-eighths its force acting from the right.

One of the questions often asked is whether the bullet can ever be deflected faster than the wind itself moves. That is if the wind is blowing ten miles an hour at nine o'clock will it move a bullet to the right a distance greater than the wind itself moves in the same amount of time? This is practically asking whether a bullet is blown in the wind as far as a feather would be blown by the same wind. Of course it is well known that a boat can sail much faster than the wind and in the same way a badly balanced bullet once it gets its point deflected may possibly exceed the wind. This is not a true lateral drift however as in this case the bullet actually starts traveling in a new direction to a certain extent. Generally speaking the bullet on account of its great weight as compared to air and its great inertia will not be affected nearly to as great an extent as the wind itself will move.

A New Department

(Concluded from page 17)

whims. The second class is made up of men who have devoted years to perfect one line only. Dr. C. C. Foster of Cambridge, Massachusetts, collects U. S. muskets and carbines and his collection is as nearly complete as is possible to make it. Mr. Fred Hines of Boston has a miscellaneous collection of guns and pistols which is the best obtainable. The great collection of American pistols of Mr. Harry B. Harmer of Philadelphia is superb. Kentucky rifles are handled by many but the best collection is probably that of Marc Woomansee. Captain Dillin, of Philadelphia, has made a study of Kentuckies for years and is probably as well posted as any man on this subject.

We know that this Department is going to be of great interest to present subscribers as well as create enthusiasm on the part of collectors and individuals. So let's get together and whoop things up, each one doing his bit by contributing any articles he thinks may interest the fans of this column.



Conducted by Col. C. E. Stodter

CIVILIAN rifle clubs are organized under acts of Congress and are provided with certain supplies which are purchased from annual appropriations made by Congress. The purpose of the organization of these clubs is to spread a knowledge of rifle shooting, and particularly of shooting the Service rifle, among the civilians of the country in order that in case of need we shall have a large number of men qualified for duty as instructors in rifle practice. To enable members of civilian rifle clubs to qualify themselves for this duty, the War Department makes an issue of rifles, ammunition, and target material to such clubs. There are provided also certain qualification courses which are to be fired each year by these clubs and the records sent to this office. These courses were published in the last issue of "The American Rifleman." The change in the course to be fired is practically the only change in "Rifle Marksmanship," and the course of instruction as laid down in this publication still continues in effect.

In the organization of a rifle club its members should have in mind the fact that in return for the assistance rendered by the War Department they owe a duty to the government to make themselves as proficient as possible in the use of the rifle. It appears that some clubs do not fully realize their duties and responsibilities and that they are not organized with a sufficient understanding of what is expected or required of them. The result has been that a number of rifle clubs have been organized, have existed for a short period of time and then have disbanded. There are many reasons for the short life of such clubs, among them being the inactivity of the officers, the failure of the club to secure the necessary ranges, or the fact that the more active members have become separated from the club.

The continued existence of a civilian rifle club depends very largely on the activities of its officers and the soundness of its organization. It also depends upon the range facilities and club house facilities available. With proper organization, active officers, and suitable range facilities there would be no reason why a rifle club should not be carried on and continue to grow in the same manner as any other athletic club, as for example, the numerous golf clubs which we find throughout the country. It is important that the officers of the club be men who are familiar with rifle shooting, and who have sufficient interest in the sport to give it considerable time and attention. The president of the club and several of the other officers should be men of some business ability, if possible to secure such men, in order that they may properly take care of the business

activities of the organization. Usually the greater part of the work falls upon the secretary, who should be a man who is not only an enthusiastic rifleman but one who is able and willing to devote a considerable part of his time to the affairs of the club. He is a man who is usually depended upon to keep the club going, to secure new members, to get up new programs for the regular meetings, and to look after all the correspondence. He frequently has to assume charge of the property of the club. The executive officer also should be a good rifleman and one who can spend considerable time in looking after the ranges and providing the necessary facilities for shooting. A rifle club cannot continue to exist unless it constantly secures new members.

At the present time rifle shooting is one of the sports in many of the schools and colleges of the country and rifle clubs should be especially active in getting the graduates of these institutions into the clubs. The Boy Scouts' organizations also form a source of supply for new members, likewise the Winchester Junior Rifle Corps is another organization which graduates a large number of young men each year and members of these organizations should be given every opportunity and encouragement to join the government rifle clubs.

It is difficult to keep up interest in a club unless there is some form of competition carried on throughout the year. In other words, if the members merely meet once a week and shoot only for the pleasure of shooting, some of the members will lose interest. Therefore, it is very desirable to institute some form of competition, such as weekly matches, extending over a period of several weeks and involving shooting in various positions, a small prize being given to the winner at the end of the series. In order to encourage new members a handicap system should be established so as to give them a reasonable chance with the best shooters of the club. In addition to competitions within the club, the club should arrange for competitions with neighboring clubs, either by visiting each other or by arranging the competition by mail. State associations frequently arrange for a series of competitions among all the clubs in the state.

Probably one of our greatest difficulties in keeping rifle clubs active and growing is the difficulty of obtaining proper range facilities. As the population increases, and as towns and cities expand, desirable sites for ranges are becoming harder to obtain. However, nearly all our country clubs and golf clubs have some space in their grounds where a small bore range could be established, and it is believed that such an activity

could be well established in connection with such clubs. It also is believed that the time has come when towns and cities should recognize that rifle shooting is a sport which is entitled to the same consideration as baseball, tennis, golf, and other sports, which are encouraged and provided for by the municipality. A few of our cities have provided municipal ranges. Such a range has been in existence in San Antonio for several years. Usually there is some place in a public park where a range up to 200 or 300, or possibly to 600 yards could be established. It probably would be necessary to construct the range with more than usual protection, but there is no reason why such a range cannot be constructed and made perfectly safe. It usually is necessary to provide an artificial backstop and also to build a wall with port holes through which the shooting is done in order to insure the necessary safety. In some places it may not be advisable or desirable to establish municipal ranges for the Service rifle but there is hardly a city or town in the country that cannot find some suitable place for the establishment of a small bore range.

Another important element in the success of rifle clubs is having a suitable club house or club rooms, at or in the near vicinity of the range, where the members can meet and where the social activities of the club can be carried on. It is believed that the success of golf and country clubs in general depends very largely upon the social activities carried on by them. In other words, the sport alone is not sufficient to keep clubs in existence. Rifle clubs also should give considerable attention to this matter. Many people who are not especially active in the shooting game would like to belong to a rifle club if there were some social advantages to be derived from such membership. A suitable club house where a member could bring his wife and friends on the occasion of the regular weekly meetings would be of immense advantage to a rifle club.

It frequently happens that a city has several rifle clubs, each carrying on its activities in its own way and without much or any relation with the other organizations. It is believed that in these cases it would be very desirable if these clubs combined under one large organization and established a central club house and range. This is being done in some of our cities. The shooters of the City of Buffalo, including rifle, shot gun and pistol shooters, have formed an organization and have purchased seventy (70) acres of land just outside the city limits and have built an excellent club house, established traps for the shot gun men and have laid out a range for the rifle and pistol shooters. This proposition was financed by sale of bonds to the club members. The property is so located that it will increase in value and the new club thus has, not only an excellent place in which to shoot but has a real country club to which families of the shooters can go also and enjoy themselves in various social and athletic activities. Some clubs might object to losing their identity in a larger organization but there would be no objection to a number of clubs belonging to such an organization and each club keeping its own identity, the larger organization simply exercising general control and affording a place in which all the shooters could enjoy their favorite sport.

Death Calls Three Old-time Riflemen

William Morgan ("U. M. C.") Thomas

MR. WILLIAM MORGAN THOMAS, familiarly and affectionately known to sportsmen the country over as "U. M. C." Thomas, passed away at his home in Bridgeport, Connecticut, on November 5th. He had been ill but a very few days with pneumonia.

Mr. Thomas was born in Wales in 1848. At the age of 14 he came to the United States sailing from Liverpool in a sailing vessel which required sixty-five days to make the voyage. He came to Bridgeport in 1869 and found employment in the Cartridge Works then just being developed on the ground which is now a part of the U. M. C. Bridgeport Works of the Remington Arms Company, Inc. He was not a "rolling stone" and remained continuously in the U. M. C. Works until his retirement from active service which occurred several years ago when he completed his fiftieth consecutive year of service with the Remington Arms Company and its predecessors.

He was first employed in the loading department of the Union Metallic Company. During the early part of the Russian-Turkish War Mr. Thomas acted as Chief Inspector of manufactures of the Peabody Martini rifles for the Turkish Government. In this work he was associated with Mr. A. C. Hobbs, Superintendent of the U. M. C. Cartridge Plant. During this same period he was engaged in the development of primers for metallic cartridges.

Some time later he was placed in charge of the Inspection and Ballistic Department at the U. M. C. Plant and for many years was active as a pioneer in the development of paper shotgun shells, Metallic cartridges for rifles and pistols, primers, smokeless powders and almost everything connected with the arms and ammunition industry.

His reputation as an authority on everything pertaining to ammunition manufacture spread beyond his adopted country and he was several times called to England to lend aid and assistance to English engineers in ballistic matters.

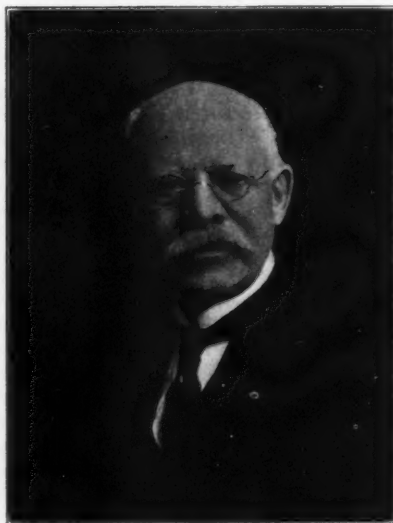
In 1899 Mr. Thomas went to Mexico in connection with a contract for ammunition for that country and while there was entertained by the then President, Porfirio Diaz.

In 1919 after having served the Remington Arms Company, Inc., and its predecessors for fifty years Mr. Thomas was retired from active duty. On the occasion of a dinner given in his honor and to celebrate the completion of his fiftieth year of honorable and able service the many beautiful and valuable gifts presented by his old associates and friends testified to the high esteem in which he was held by his associates, many of whom had served the same company almost as long as he. On that occasion at one table were grouped ten of his associates whose combined term of service in the U. M. C. Works totaled 478 years, an average of 47.8 years each.

Mr. Thomas had been for many years Ballistic

Engineer of the U. M. C. Works. Since retiring from active service he was consulting Ballistic Engineer and hardly a day passed that did not see him around the works just as keenly interested as ever in everything that was going on, giving freely of his advice on all new experiments and wherever he went there was a friendly smile to greet him as he was genuinely popular throughout the entire works. He was at his old desk only a few days prior to the end.

Mr. Thomas was responsible for a great many of the improvements and developments in paper



William Morgan Thomas

shotgun shells, cartridges, primers, smokeless powder, etc. Working in conjunction with Mr. J. Stevens of the J. Stevens Arms and Tool Company, Chicopee Falls, Mass., he developed the .22 long rifle cartridge and the .25 caliber rim fire cartridge. The .22 long rifle cartridge which has been popular for many years for its splendid accuracy at all ranges up to 200 yards owes much of its present perfection to the genius and patience of Mr. Thomas.

The .32, .32 long, .38, .38 special and .44 Russian revolver cartridges adapted to the Smith & Wesson revolvers were developed by Mr. Thomas working in close co-operation with Smith & Wesson Company.

Similarly the .32 short, .32 long, .38 short, .38 long, .41 long and .45 Colt cartridges were developed by him in conjunction with the engineer of the Colt's Patent Fire Arms Mfg. Company to whose revolvers these cartridges are adapted.

Similarly the automatic pistol cartridges of different calibers were developed by Mr. Thomas working in conjunction with Mr. John M. Browning the inventor of the automatic pistol and with the Colt Company's manufacturing those pistols at their plant in Hartford.

Smokeless powder was first loaded in revolver cartridges by Mr. Thomas at the U. M. C. Works

and he developed the first successful primer for use in revolver cartridges loaded with smokeless powder. He developed the grooved shells for smokeless powder revolver cartridges, the bullet having an inside lubricant.

When Mr. Thomas began his development of modern primers the system then in vogue was to have the "anvil" of the primer a part of the shell, this being known as the old Berdan primer. Mr. Thomas developed the modern primer in which the anvil is a part of the primer itself. This type of primer is now used exclusively.

The Thomas pointed bullet is another of his developments. It was this type of bullet with which the American rifle team won the Palma Match at Ottawa in 1907 and with which Americans have since that time held the front rank in rifle competition and at the international match at Bisley, England, during the present year it was the 220 grain Thomas pointed bullet with which the United States team won against seven competing international teams.

For many years Mr. Thomas attended the more important shooting events throughout the entire country. He was always interested in seeing for himself the performances of the various types and kinds of ammunition. Through his attendance at such events he became widely known and well loved among the shooting fraternity who dubbed him "U. M. C. Thomas," a name which always followed him and which was used by those who knew him best as a term of friendship and affection.

Mr. Thomas was a 32nd degree Mason and for many years had been identified with Corinthian Lodge No. 104, Hamilton Commandery, Pyramid Temple Mystic Shrine. At the time of his death Mr. Thomas was seventy-five years old. He is survived by his wife, two sons, Edgar R. Thomas of Stratford, Conn., and Stanley G. Thomas of Elmhurst, L. I., and two daughters, Mrs. Norman D. Hovey of Stratford, and Mrs. Ervin W. Sanford of Columbus, Ohio. His friends everywhere mourn the passing of a widely loved gentleman and a real pioneer of the ammunition industry.

Sergeant August Dietrich

SERGEANT AUGUST DIETRICH, for many years one of the leading figures at the Sea Girt range, has answered the last roll call. He passed away at his late residence No. 90 North Fourth Street, Paterson, N. J., at the age of 65 years. "Gus" Dietrich, as he was affectionately known to the riflemen of New Jersey, joined the New Jersey National Guard back in 1883 when a company was organized in his home city. He had been a member of one of the old time rifle clubs and brought his skill and enthusiasm to the new military company. Perhaps to him more than to any other man his regiment is indebted for its reputation as the best regiment of rifle shots in the state. He was the first member of the regiment to qualify as an expert and was the winner of the Governor's Championship Medal in 1903, the Perrine Medal in the same year and the Judd

trophy in 1890. He was a member of the team which won the "Soldier of Marathon" trophy in 1887 and in every subsequent year up to and including 1897.

He was a charter member of the Columbia Rifle Club of Paterson, one of the leading Schuetzen Clubs of New Jersey, and was just as expert with the "free" rifle as he was with the military arm. "Gus" was on the outdoor small bore range of this club on Armistice Day and put up good scores. On that day the club which is affiliated with the N. R. A., had completed arrangements for a range for the .30 calibre, and Dietrich showed his usual enthusiasm in the discussion of plans for the outdoor season of 1924. To the end he kept his interest in the rifle and almost his last request was that a firing squad be at his grave side, and so on Tuesday, December 11th, when all that was mortal of Gus Dietrich was laid with Mother Earth members of his old regiment and an Overseas Bugler rendered to a good soldier the last sad service.

Captain Geo. W. Chesley

CAPTAIN George W. Chesley, maker of many long range records, died November 30, following a protracted illness at his home in Wakefield, Massachusetts. Attended by five of his old shooting partners and delegations from the Spanish War Veterans, the American Legion and the Odd Fellows, he was buried in the Wakefield Cemetery on December 2.

Captain Chesley who was one of that group of shooters who were the top notchers of the game from about 1908 to 1918 and which included such shots as Richard, whose shooting partner Chesley was, Winder, Casey, Wise, Emerson and half a dozen others, was a member of the Richardson Light Infantry (Co. A, Sixth Massachusetts) during the Spanish American War, and later served with Co. D, 2nd Connecticut Regiment. During the World War, he held a Captain's commission in the Ordnance Department as one of the Corps of rifle instructors and demonstrators. He was a member of many prominent rifle clubs.

A brief resume of Captain Chesley's shooting activities shows that in the early nineties he won three medals at Walnut Hill in the matches of the Massachusetts Rifle Association, and that during the ten years which followed he won numerous company medals and other prizes. His more important victories and his team record include:

In 1905, the General Lawrence Trophy at Wakefield, Mass., among a number of others. Member of the Massachusetts State team in 1903-4-5-6.

Member of the Connecticut State team in 1907-8.

In 1907 winner of the Spencer Medal at Sea Girt.

In 1908 won four firsts at Wakefield, the Governor Floyd, the General Lawrence, the General Tolles and the Hayden matches and several others elsewhere.

In 1909 won the Nevada Medal at Sea Girt; made range record with 23 straight bull's-eyes at 1,000 yards at the Bay State Rifle Range; won the New York State Rifle Association match medal at Sea Girt, and won the General Lawrence match at Wakefield.

In 1910 won the Nevada Medal, the General Tanner Trophy, and the General Lawrence trophy.

In 1912 was on the Palma team at Ottawa, Canada, and won the Meany match at Sea Girt.

In 1913, 23 straight bull's-eyes at 300 yards at Wakefield, on August 30 in the last compe-

in practically all the big matches as a member of different company, regimental and civilian teams during the period since 1893.

Chesley was a competitor in the 1919, 1920, and 1921 National Matches but shortly thereafter suffered the complete breakdown from which he never recovered and which resulted in his death.

Funeral services were held at the Chesley home by the Odd Fellows and the services at the grave by the military organizations to which Chesley belonged. The services at the cemetery were in charge of Colonel Gibon, his old company commander, and the pall bearers were all old shooting partners of his, namely: Captain Gray, Captain Murphy (Billy of Walnut Hill), Major Connelly, George Durward, George Reid and James H. Keough. There were about 25 of the World War Veterans and about 30 Spanish War Veterans with their colors and a firing squad composed of veterans of both organizations. Taps was blown by the bugler who took Chesley's place after the Spanish War and was repeated by another bugler from the Legion in a distant part of the cemetery.

Shotguns, Powders and Cartridges

(Continued from page 8)

because of this since one ounce of shot in upland shooting is about right anyhow.

The new progressive compounds seem to have been made expressly for small bored sixteens, twenties and twenty-eights. These are normally higher pressure guns than the twelve is, and from using Du Pont T. or Du Pont 93, we can get a wider range of loads and a wider range of velocities than is practical in the twelve. For example, Du Pont T. shoots loads in the twenty bore of 7-8, 15-16, 1 oz. 1-16 ounces (if anybody cared to use it) driving all the loads sharply, with very uniform and not dangerous pressures. For such guns, for all guns smaller than the twelve, the new powders might well be used for every purpose, almost every load in common use, but in the twelve gauge the powders are confined to heavy duck loads and are not adapted to anything else. In the ten gauge, I might add, it is difficult to design a proper load since pressures in that bore are so low that it is difficult to load enough shot to force the powders to their burning pressures. This difficulty will no doubt be overcome in time, but at present a full ounce and three quarters of shot must be loaded in a ten gauge shell. Otherwise the powder will sometimes reach the muzzle while still in full flame and result in a heavy muzzle flash and a poor pattern.

Conditions hinted at above mark present powder and ammunition developments. In the twenty bore we have nearly perfect loads, using an ounce of shot; in sixteen bore very good loads using an ounce and an eighth, in twelve bores extremely good duck loads using an ounce and a quarter or more. In ten bores nothing is settled as yet.



Captain George W. Chesley

tition for the Palma team; made a world's record at Camp Perry of 224 out of 225 at 800, 900, 1,000 yards, losing one point on the 13th shot at 800 yards; was a member of the Palma team at Camp Perry; won the Leech Cup in the N. R. A. matches at Camp Perry.

In 1914 won a series of minor matches.

In 1915 won the New York State Rifle Association match among many others.

In 1916 won the Grand Aggregate Match at Jacksonville, Fla., and the Members' Match also; third in the President's Match by two points and high in several others.

He was coach of the Connecticut State team in 1918, and has coached several company and regimental teams at various times. He had always been active in small-bore shooting and in many civilian rifle clubs. Altogether he shot

THE NRA NEWS

Conducted by C. B. Lister

MORE ACTIVITY IN N. Y. STATE

THE following paragraph from a letter from Joseph A. Burns, Assistant State Adjutant of the American Legion in New York State, gives promise of the organization of a number of clubs among the legionnaires of the Empire State:

"I see no reason why we cannot interest more of the Legion Posts in this Department in the creation of Rifle Clubs. In a series of District Conferences to be held during the coming year, attended by the Post Commanders and Adjutants, this idea will be advanced as a splendid means of keeping alive the interest of ex-service men in shooting, developing, among other things, 'a firm hand and steady eye.'"

Most Legion Posts either have the use of local armories or their own club houses, so that any of the Posts taking up rifle shooting should have no difficulty in locating or building an excellent gallery. Such activity on the part of legionnaires is of interest to followers of the game for several reasons, one of which is that the newspapers generally follow the activities of the Legion Posts pretty closely, and their rifle shooting activities will obtain their full measure of publicity. In the second place, the additional clubs will afford the present civilian organizations an opportunity to arrange more shoulder-to-shoulder competitions. And in the third place, it may be possible that some of these legion ranges will furnish the equipment that local riflemen have been unable to obtain for themselves due to high rents or police regulations, and so will afford the opportunity for increased activity among all the civilian riflemen of the State.

IT PAYS TO ADVERTISE

The Solon Springs, Wisconsin, Rifle Club is what might be called an ordinary rifle club. That is, it numbers among its members no particular national celebrities, but it is not an ordinary rifle club from the standpoint of activity. Witness what W. J. Posey, secretary of the outfit, says:

"Our Club, through the courtesy of Mr. J. T. Murphy (owner of the Superior Evening Telegram), in printing news articles of our shoots, is now known throughout northern Wisconsin and Minnesota, and last summer we had N. R. A. members from other states take part in our matches, while they were visiting here."

The rifle shooting fraternity is a growing one, and despite its rapid expansion in the past few years, it has become more closely knit into a real organization. You will be surprised to find how often a rifleman from out of town will drop in at one of your shoots for a swapping of ideas, if you let the rifle shooting world know that you are in existence. Incidentally, the best way to get this information around outside of your immediate locality is to enter teams in the Gallery

and Outdoor Small Bore matches, the results of which clubs from all over the country are watching. Another way to get your outfit into print is to send us some worth-while ideas that can be passed along to other clubs through these columns.

BREAKABLE TARGETS

Every rifle club secretary has wished for breakable targets which might be used in novelty matches and which could be obtained without bringing financial ruin to the club. Mr. H. S. Seely, Secretary of the Onondago, New York, Rifle Club, tells us that they have solved this problem by procuring "cull" plates from the potteries in their vicinity. Cull plates, for the information of those who know no more about them than I did before receipt of Mr. Seely's letter, are the unglazed seconds which are thrown out by the potteries as of no value. Of course, only a few clubs are situated in the vicinity of potteries, but those who are will probably find it profitable to look around for "culls."

SPRING PROGRAM UNDER WAY

The first draft of the small bore rifle portion of the Spring Program has been completed. If you have any ideas on how to improve last year's program, shoot them along now for consideration. If we agree with you, we will use your ideas, and if we do not, we will tell you why. In either case, we will both benefit through an exchange of ideas. It is planned to elaborate on the Spring Program this year, introducing events for hunting rifles, and possibly for the service rifle, mailing competitors score cards instead of targets.

What do you think of this plan, and what kind of matches would particularly appeal in your territory?

SUPPLY ACTIVITIES INCREASING

If the sale of .22 calibre ammunition, rifles, and gallery targets is any criterion, the gallery program this year will be the most successful in history. The shipments of supplies have increased to a point requiring the entire service of one section of the headquarters personnel, and it has been difficult at times to carry an adequate stock of supplies on hand. All loading and arms companies have reported an unusually big year for .22 calibre cartridges and rifles. Reports which may be taken to indicate more plainly than anything else can the increased interest in the .22 game which is being manifest throughout the country.

CALIFORNIANS POINT THE WAY

One of the basic causes for the inactivity of rifle clubs is that few matches are held, and that these matches are generally hurriedly cooked up and not sufficiently advertised in advance. The program for 1924 for the California Rifle and Pistol Association has already been announced. In addition to letting the members know in advance what is going to happen, a glance at the match program will indicate what can be accomplished when the civilians, National Guard, and Regular Services get together.

January 20—Oakland Rifle Club Trophy.

February 17—30th Infantry Trophy.

March 16—462nd Company, C. A., C. N. G., Novice Match, and Long Range Match.

April 20—United States Navy Trophy.

May 18—Golden Gate Rifle Club Novice Match, and Long Range Match.

June 15—Olympic Club Trophy.

July 20—19th Infantry Trophy.

August 17—Southern Pacific Rifle Club Trophy.

September 21—Novice and Long Range Matches.

October 19—California Coast Artillery Trophy.

November 16—Individual Championship and Qualification Match.

December 21—Coast Artillery Trophy.

The activities of the California Association have accomplished another thing which is of the utmost importance to the game, and that is to keep those men shooting who have attended the matches at Camp Perry. Too frequently members of the National Match Teams go home, lay aside their guns, and think no more about it until time for next year's tryouts. The following paragraph from the latest bulletin of the Association indicates that there are a number of old friends very much in evidence in the shooting game on the West Coast, even at this time, when the National Matches have been over for two months or more:

"The contest for the Coast Artillery Trophy, held Sunday, December 2, resulted in some excellent scores. The weather conditions were ideal, it being bright, warm, and almost without wind. A new entrant, the United States Marine Corps, from Mare Island, on which were some of the members of the 1923 Camp Perry champions, led almost from the start, though their total score at 600 yards was surpassed by those of the Coast Artillery and the Olympic Club.

"The score of Corporal Leo Petrosky of the Leathernecks, 240, with the rapid fire on Target A, is a high mark for our members to shoot at during the next year. High civilian competitor was E. N. Moor, Jr., with a score of 232."

A third and extremely important project which the Californians will undertake this year will be to pay their Secretary-Treasurer "such sum for his services as the Executive Committee shall determine upon after devising ways and means of securing an income for that purpose." To do full justice to his office, the Secretary of the State Rifle Association must put more time and energy into his work than it is possible for any man to do who has to earn a livelihood. It is a safe assertion that the California Rifle and Pistol Association will gain a great deal more during the coming year than they may decide to spend on the services of Captain Mallett.

Have You Sent In Your Reaffiliation for 1924?

FIELD ARTILLERY R. O. T. C. UNITS TO COMPETE FOR N. R. A. TROPHY

A handsome challenge cup made up of a bronzed 4.7 inch shell mounted with sterling silver handles and appropriate decorations was presented to the Field Artillery units of the R. O. T. C. last year by the N. R. A. The competition was arranged for at the suggestion of the Chief of Field Artillery. Sixteen units entered the competition last year and the cup was won by Alabama Polytechnic Institute. The Chief of Field Artillery has already issued a circular letter to all Field Artillery R. O. T. C. units calling their attention to the competition this year and expressing the hope that every unit will be represented in 1924. Teams of five compete and fire the dismounted course as described in Pistol Marksmanship. The match is fired out of doors and the aggregate of the five scores counts for record. The .45 automatic pistol and ammunition as issued will be used, and all firing will be under the direct supervision of a Regular Army officer who will certify on the score sheet that the requirements of Pistol Marksmanship have been complied with. The match may be fired on any date between April 1st and May 15th, inclusive, all firing to be completed on one day. In addition to the challenge cup, silver medals are awarded to members of the winning team, with bronze medals to the second and third teams. The interest in rifle and pistol marksmanship manifest by the R. O. T. C. in the schools and colleges throughout the country has been one of the most encouraging features of work of the Association during the past season.

IF YOU INTEND TO ORDER SUPPLIES, READ THIS

Effective December 1st, all supplies except Stazon products and score books will be forwarded express collect unless the necessary amount of postage in stamps accompanies the order. The price list gives the shipping weight of articles that can be shipped parcel post, so that it is possible to ascertain from local postmasters the exact amount of postage, plus the amount of insurance, that will be required to transport the package from Washington. The supply activities of the N. R. A. have grown to such an extent that the extremely limited personnel available for handling shipments and billing have been completely swamped by the great number of small accounts made necessary by requests for shipment of parcel post when improper remittances were forwarded. If this service is to be continued without being tied up, all possible co-operation will have to be enlisted from the purchasers.

THE STATE CHAMPIONSHIPS

Competitions where everyone knows everyone else always create more interest locally than national championships, where the shooters are scattered and strangers to one another. The State Association in Washington is going to take advantage of this fact this winter and plans to enter at least five teams in Gallery Match 20, and twenty-five individuals in Match 12, so that they can take advantage of the State Championships.



The Oregon National Guard Team, Winner of the Hilton Trophy in the 1923 National Matches

THE WAY THEY DO IT IN OREGON

The following extract from the "Oregon Guardsman" of November 15 is well worth the attention of every National Guard Organization and of the Civilian State Associations which send teams to Camp Perry:

RIFLE TEAM TO BE ENTERTAINED

"Members of the Oregon National Guard will pay homage to the Oregon Rifle Team which won so many honors during the National Rifle Matches held at Camp Perry this year. Heading the program will be a consolidated drill of all units, at which members of the Rifle Team will occupy a place in the reviewing stand as special guests of honor.

Following the drill the team members will be royally entertained by their comrades at a smoker to be held in the ball room. The occasion is scheduled for 8:15 p. m. Tuesday, November 20, and will be held at the armory in Portland.

The detailed program for the evening has not been made public, but it is understood that on this occasion The Adjutant General will formally receive for the State of Oregon the Hilton trophy which was won by the Oregon team after a spectacular contest in which they out-shot every National Guard Rifle Team in the United States.

Members of the rifle Team residing in Portland were recently entertained at a luncheon given by the Portland Chamber of Commerce."

A little fuss made over the boys when they return from Perry makes the trip mean a great deal more to them, gives the newspapers something to write about, and causes every man in the organization to look forward to the opportunity which he will have next year of going to Perry and coming back and having some fuss made over him. It is all very well to say that we do not want any fuss made over our accomplishments, but the fact remains that deep down in our hearts we like to be appreciated.

CALIFORNIA RIFLE AND PISTOL ASSOCIATION ELECTS FOR NEW YEAR

At the annual meeting of the Association, held during the noon intermission in the contest for the Coast Artillery Corps Trophy, on Sunday, December 2, 1923, the election of officers for the ensuing year was held, with the following results:

President, C. W. Linder, Infantry Officers Reserve Corps.

Vice Presidents—

H. P. Ronkendorf, Roberts Island Rifle Club.

Lieut. I. R. Dierking, 30th Infantry, U. S. A.

Lieut. W. C. Gilman, U. S. Marine Corps, Mare Island.

Executive Officer, Major D. P. Hardy, Coast Artillery, C. N. G.

Secretary-Treasurer, Capt. W. H. Mallett, Coast Artillery, C. N. G.

Elsewhere in the magazine is an individual application blank. It was put there largely for the benefit of the fellows who pay three dollars for the paper because they are not members of the Association. There is no objection, however, to your tearing the blank out and endorsing it for somebody who neither reads the paper nor belongs to the N. R. A. at the present time. If you do not want to spoil the magazine, we have plenty of application blanks that we can send you for this purpose. Does it ever occur to you that the only way the N. R. A. gets new members is when its present members sign them up? We cannot afford paid advertising nor traveling salesmen. The more shooters on the books, the more we will be able to initiate next year, and the less chance of the passage of anti-laws which will not only stop target shooters from engaging in their favorite pastime, but will prevent home owners from defending their own property.

How many application blanks in addition to the one in the magazine do you want?

How Many New Members Have You Signed Up?



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What About the "7 Millimeter"?

By Townsend Whelen

JUST what relation the 7 m.m. rifle bears to the American sportsman's battery is a question which is of late coming up with great frequency. Many sportsmen are confronted by the desire for a rifle which will give great accuracy combined with the minimum consistent weight. A typical letter on this subject has been received from V. S. Thayer, of Readsboro, Vt., who in asking for an opinion as to the most practical rifle for such game as deer, black bear, and perhaps an occasional moose or caribou, says:

I have personally shot deer with rifles of several different calibers, including the 25 Remington Automatic, the Savage Bolt Action 250-3000, the 7 m.m. Mauser, the 30-40, the 30 Springfield and some other sizes. The last one being shot with the 250-300.

One thing I insist upon is great accuracy, and this is possessed in the most of those mentioned at ordinary game ranges. The last deer shot with the 250-300, was a large buck weighing 250 pounds, deer standing quartering at 80 yards, the open point Western 100 grain bullet struck possibly a little low, broke the shoulder but did not shatter it, and penetrated into the cavity, tearing a very large hole in the heart—on the inside of ribs on the opposite side of cavity there was signs of flying pieces of the bullet having struck, but none of them penetrated sufficiently to lodge.

I was unable to properly bleed this deer, and found the inside well filled with blood when the animal was dressed, this being done immediately. Personally I believe better results can be had with a heavier bullet, but to be sure to get the flat trajectory of this cartridge one has to be used of light weight. The deer mentioned above managed to get about forty yards before it laid down for keeps. I have shot some large game with the 8 m.m. using the 236 grain bullet and it certainly does fine business, but the recoil is possibly a little heavy the accuracy of this cartridge has not been worked up to the degree of the New Springfield, and no doubt either the 7 m.m. or the New Springfield would be a better rifle for general use.

Personally I have great regard for the 7 m.m. cartridge and what deer I have shot with this

rifle have been killed very satisfactorily the bullet showing very deadly work, although it would seem that it went to pieces a little too easily, was using the 139 grain open point. Also I find this rifle tested the most—a pre-war Spanish Mauser, shows very fine accuracy, and at ranges tried, which were up to about 500 yards, the accuracy was just as good so far as I could determine as I could get with a Star gauged Springfield. Perhaps this is an exceptional rifle for this caliber or perhaps the results obtained would not be the same if tried out repeatedly, but the fact remains that I shot groups as small with the Mauser as I could get with the Springfield.

No doubt you are in a position to tell me if these results were luck.

I am a life member of the N. R. A. and no doubt the cost of arms and ammunition would lead to a selection of the .30 caliber, although I am informed that there has been some testing done during the last year, by the Govt., of this 7 m.m. caliber.

The idea is this. I want a rifle of the finest accuracy, of the lightest possible weight, consistent with this accuracy which is capable of killing any game on the continent if rifle is handled with accuracy, and don't like to think of packing an arm which weighs more than seven or seven and a half pounds as I prefer to track my game and this means miles of travel. However I must have the accuracy, and do not wish to cut the weight to the extent that it will affect the accuracy to any great extent.

I would like your personal opinion of the subject, including caliber, length of barrel, kind of sights and any other information you are able to give.

Up to the present, I don't believe there is any rifle on the market which suits me as well for all kinds of hunting in all kinds of places as the Bolt action, and I have tried out quite a good many dozen of rifles of different actions, including the Automatic and lever action.

Now, I have had considerable experience during the last year which has caused me to change my views somewhat relative to big game rifles. I do not want in any way to indicate that the Springfield is other than a

most perfect rifle for all big game (except thick skinned game, such as elephants, rhino, etc.) the world over. But for American game the Springfield really has excess power, and I think the sportsman hunting in America will in some respects be as well served, and in other respects be better served by the 7m.m. My experience with this rifle dates back only about nine months, and my evidence as to its conduct in the hunting field so far is entirely hearsay, but I have come to have the highest opinion for it. With proper ammunition it has ample killing power for any American game, including large bears. Over all hunting ranges (up to 500 yards) with good ammunition it is as accurate as the Springfield. With certain cartridges it has flatter trajectory than the Springfield. The recoil is less. The ammunition is lighter, and the rifle can be made lighter than the Springfield. Also 7m.m. is a better caliber than .30 if one wishes to use light charges for small game.

The excellence of the 7m.m. is partly explained by the fact that in the cartridge the bullet is seated in the case with considerable of its cylindrical bearing extending outside the case, and the standard chamber is cut with a throat that most perfectly fits the bullet. The tolerance between cartridge and chamber is much smaller than is the case with many rifles. Both these things make for better accuracy.

The longer the barrel the better the velocity, accuracy, and swing. The heavier the barrel the better the accuracy. Both of these within reason. To get extra light weight it is usually better to shorten the barrel than to make it very thin. Efficiency drops off very quickly when the length of the barrel is reduced below 20 inches. In constructing a light rifle one is limited considerably by the weight of the Mauser action. The Mauser action is about four ounces heavier than the Springfield action. These are the principles we must go by.

With either Mauser or Springfield action a 7½ pound rifle with a 24 inch barrel means a very thin barrel. If I wanted to keep the weight down to 7½ pounds I would choose a 20 inch barrel of ordinary, not featherweight. At any rate I think we can say that a 7½ pound rifle in 7 m.m. is the minimum efficient weight. It is possible to go lower, but only by sacrificing accuracy considerably.

For all around use I think the best is a 24 inch barrel of almost the same outside dimensions as the Springfield barrel. It will weigh about 8 lbs. 4 oz. in Mauser action, but it will be a better long range rifle than the shorter or lighter rifle.

For my own use, being large and strong, I am going to have my 7 m.m. rifle made with 26 inch barrel of the same weight as the Springfield barrel, and it will weigh about 8 lbs. 7 ounces.

As you already have a good 7 m.m. rifle it is but extravagance to change. But just for your information, I think Griffin and Howe, whose circular I inclose, make the best 7 m.m. in the world. Certainly it is quite a little more accurate, better finished, and better adjusted than any others I have tried.

While the Western ammunition with 139 grains open point Lubaloy bullet, muzzle velocity in 30 inch barrel 3,000 f. s., is excellent ammunition, I doubt if it is the best ammunition for really heavy big game. The bullet flies to pieces too much. So, too, for that matter do all 180 or 150 grain expanding bullets in the Springfield at M.V. 2700 f. s. or over. It is not possible to make an expanding bullet which will not fly all to pieces on game if delivered at 2700 f. s. But there is one way to make an expanding bullet which will mushroom well and yet not go to pieces at velocities under M. V. 2400 f. s. M. V. 2400 f. s. is fast enough to give a flat trajectory over hunting ranges so that the hunter will not miss his game due to errors in estimating distances. With M. V. 2400 f. s., or thereabouts, the heaviest properly constructed bullet within reason that can be used is the best.



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New Dope on the .400 Whelen Rifle

We have received the following letter from one of our customers who is a big game hunter of many years experience:

"I am enclosing two bullets taken from a moose I shot this fall with the .400 Whelen. I was extremely anxious to try this gun out on a moose this year and I hiked around the country nearly 100 miles before I got the opportunity. I sacrificed my feelings of consideration for the moose by taking the first shot through the hip and the second through the shoulder. At the second shot the moose dropped exactly as if somebody holding him by the neck had let go. On skinning the moose out I found pieces of rib about 3 inches long, and both bullets dropped out, being merely held by the skin on the opposite side. My guide, a man of great experience, assured me that he had never seen anything so effective before. I tried the .400 rifle out against the .350, .375 Magnum, and .333-bore English rifles of very high grade, and find it much more comfortable to shoot than the two first mentioned. I incline to the thought that it is more accurate, and undoubtedly it is far and away easier to clean."

Another satisfied sportsman, just returned from Africa, writes relative to his .400 Whelen rifle:

"It measured up beyond expectations, proving a good killer at all times. A great deal of the shooting was at long range. The bullet carried up well had fine penetration, and mushroomed very well. The gun itself is well balanced, and very accurate, and gave no trouble whatever. Among the heavier game killed were elephant, rhino, hippo, buffalo, and eland. In no case except a buffalo were more than two shots necessary. Elephant killed with two .400 solids through the lungs. Rhino killed with a soft point .400 back of the shoulder. One buffalo killed with .400 solid in hind quarters, breaking left hind leg and right shoulder, bullet lodging under the skin. Eland bull (largest African antelope) killed with one .400 soft nose through shoulder, shoulder smashed and lungs badly torn up, range 400 yards."

The recovered bullets from moose and the African game all show fine mushrooming, and in every case over two thirds by weight of the bullet remaining intact.

In Tanganyika Territory, where the game is now most plentiful in East Africa, and where most of the good hunting is had, any rifle smaller than .375-bore has lately been prohibited. This means you can't use your Springfield, or any other small bore. The .400 Whelen is the best all-around rifle for Africa or for the heavy game of America. Send for circulars.

GRIFFIN AND HOWE, INC., Rifle Makers
234 & 236 East 39th St., New York, N. Y.

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FECKER SCOPES

Are Scopes that Fit and are "Fit"

ANY SCOPE for ANY PURPOSE for ANY RIFLE

You make the choice, Fecker makes the scope;
and when you use it you will find
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Instructions in Learning Accurate Pistol Shooting

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Single copies and under ten, fifty cents each. Address
orders to: Gunnery Sergeant John M. Thomas,
Rifle Range Detachment, Paris Island, S. C.

SUPER-RIFLES FOR MATCH RIFLEMEN

Realizing that the free rifle game and modern long-range competitive shooting demand a type of target rifle now very difficult to obtain, I am undertaking to assemble and supply such a rifle. At present I am assembling a lot of ten rifles, for which my price will be \$175.00 each. These rifles will have special cal. 30 (Gov't. Mod. '06) heavy barrels, in Springfield receivers; pistol grip stocks, palm rests; double set triggers; my own style butt plate; sheepskin cheek pad; Lyman No. 48 rear and aperture front sights; scope blocks, etc. They will be very similar to the rifles I have used in the International Matches, and will embody every feature that I consider requisite in an arm of this type. Each will be carefully assembled and proved by me personally and will bear my proof mark and guarantee. As accurate and well adapted target rifles they will have no superior in the world. I shall have but the ten ready for delivery this winter. Orders will be accepted only from members of the N. R. A.

WALTER R. STOKES,

508 Clifton Terrace, South,

Washington, D. C.

English Double Barrel Express Rifle

One .450 Rigby Double Barrel Hammer Express Rifle, in excellent condition, \$75.00. One Double Barrel Hammer .303 Holland & Holland English. One of the very highest grades and a splendid example of the best English workmanship, well engraved, safety locks to hammers, in perfect condition, \$150.00 Box R. A., c-o "The American Rifleman."

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HOPPE'S NITRO POWDER SOLVENT NO. 9
is the safest thing to use. It removes rust, destroys the corrosive effect of nitro powders and keeps your firearms in good condition always. You can get Hoppe's Nitro Powder Solvent No. 9 at your favorite sporting goods store or we'll send you a liberal sample for 10c. Try it now.
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Shooting Accessories

Everything to interest a rifleman. Send for my No. 6 Catalog, just out, showing over 200 cuts and complete Price List.

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FIALA PAT. SLEEPING BAG

Weights 5 1-2 lbs.—warm as 30 lbs. of blankets. No hooks, strings or other crude contraptions.

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"Without doubt, you have the best light weight bag on the market." Dr. C. P. Fordyce.

"After 23 years camping in nearly every part of our country—trying out many kinds of sleeping bags, I can congratulate you on having the lightest and warmest bag I have ever seen." J. M. Murdock.

FIALA Outdoor Sleeping Suits of pure "Angora" worsted.

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Double Set Triggers fitted to your Springfield trigger guard, complete with Sear knock-off and Sear spring, \$15.00.

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APPLICATION FOR INDIVIDUAL MEMBERSHIP IN THE NATIONAL RIFLE ASSOCIATION of AMERICA

Brig. Gen. FRED H. PHILLIPS, Jr., Secretary,
1108 Woodward Building, Washington, D. C.

Sir:

I hereby request favorable consideration of my application for
National Rifle Association of America, and enclose herewith

membership in the

Dollars, being fee for same.

I certify that I am a citizen of the United States. Age _____
in the County of _____, State of _____

Born _____

Name _____ Address _____

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State _____ Recommended by _____

Different Memberships

Benefactor, \$1,000; Patron, \$500; Life, \$25; Annual, \$2.00; Junior, 50 cents.

ANNUAL MEMBERSHIP EXPIRES WITH THE CALENDAR YEAR.

WANTS AND FOR SALE

The uniformly excellent returns from advertisements appearing in the classified columns of THE AMERICAN RIFLEMAN make it a most satisfactory and productive medium for the disposal of surplus shooting equipment, or the acquisition of special types of firearms.

Free Insertions. Each subscriber is entitled to one insertion of one-half inch, when his subscription is paid up for one year. It is necessary only to write or print the text plainly, noting thereon the date subscription was paid. These advertisements will appear in the first available issue and should be in publication office two weeks prior to the following publication date.

Paid Insertions. Non-subscribers or those who have already made use of the subscriber's privilege may take advantage of these columns at a cost of \$1.00 per inch or part thereof. No advertisement for less than \$1.00 accepted. Advertisements will be set in 6 point solid. They should be in the publication office two weeks prior to the time appearance is desired.

ANTIQUE AND MODERN FIRE-ARMS (New and used) sold, exchanged, and bought. Large stock—reasonable prices! Stephen Van Rensselaer, 873 Madison Avenue, New York City.

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Springfield remodeling of the highest order. Hand-made stocks of the finest Italian and Circassian Walnut, as you want them. English made Anson & Deeley ejectors. Scroll and flower engraved. To your order in four months.

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FOR SALE—Heavy barrel Springfield Star-gauged, pistol grip. Lyman 48 B receiver sight. Winchester 5-a telescope. Gun alone cataloged at \$71. Has been shot less than 50 times. Will sell as described above for \$70. cash. Harry Smith, Box 194, Sparks, Nevada.

RIFLE RESTOCKING AND REBLUING—We rebuild your military rifle in a sporting model and make it shoot as straight as your barrel is good. All rifles given target and working tests before shipment. W. R. McCay & Son, 839 Morton St., New Castle, Pa.

FOR SALE—43 back copies of "Arms and the Man," best offer takes them. Will also sell or trade one Savage 1919 Model rifle, Stevens Scope, 6 power No. 7 mounts, perfect condition inside and out. Erwin B. Hokanson, Rt. 1, Box 39, Clitheral, Minn.

FOR SALE—7X Hensoldt Prism Binoculars with case. In this model the prisms may be drawn out for cleaning after caps on objective end are unscrewed. No tools necessary to do this. Value about \$100. Will exchange for Springfield Sporter or shotgun, or sell for \$50. 3-barrel gun made by Three Barrel Gun Company, Wheeling, West Virginia. 12-gauge x .32-40 rifle barrel, left full, right modified, barrels are 28 inches long and perfect inside with leather case, \$95. **WANT** to buy 9 mm. or .30 cal. Mauser Pistol: .30-06; Adolph or Sauer shotgun; or combination arm. V. V. Natalish, Stockbridge, Massachusetts.

GIVE YOUR CHILD A FIGHTING CHANCE in these days of STRENUOUS competition. A Good Penman is given preference for all positions. Dr. Bevis' Aluminum System of Tracing-Pennmanship-INSURES EXACT FORM of LETTERS, CORRECT MOTION and TIME. The child cannot do it wrong. He MUST WRITE RIGHT. Complete set \$1.00; 3 sets \$2.25. Nat'l Educators Assoc., Colo. Branch, 1115 No. Custer St., Colorado Springs, Colo.

FOR SALE—256 Newton, perfect inside and out, except couple gauges in stock. Oil finish stock. Wish \$50 for rifle and 90 rounds ammunition and wish to get a large fox or rat terror bull pup or a grade Leulan Setter bull pup. F. A. Bump, Trout Creek, Montana.

FOR SALE—30 Remington Pump. Three .38 tools, .32 H. & R. target, trail moccasins No. 8 1/2, No. 48 sight, gold bead sight Springfield. 3,000 primers, .38 and .45 S. & W. barrels. Old Krag and Winchester barrels, and .44 Colt revolver. Winchester action, almost new, 28 x 2 1/2 tire and tube. New 28 x 3 reloader. Hardy hand-carved .38 cal. belt No. 32, 400 magazines, vest pocket flash. Three .32 auto. magazines reasonable. H. Z. Holliswell, Schroon Lake, N. Y.

WANTED—In gun crank condition. Springfield Sporter, Springfield 1922 .32 caliber. Marlin .22 cal. Model 38. Remington Model 14-a, 14-c, 14-d, and 14-f, in .30, .32 and .35 cal. Remington Model 25-a, 25-c, 25-d, and 25-f, in .25-20 or .32 cal. Remington Model 12-c .22 cal. One Short Lee Enfield and Krag Carbine, as issued. Wm. Smith, 5619 N. 4th St., Phila., Pa.

FOR SALE—New Super Fox; 32 inch barrel full; 60 Super X 3-inch Record loaded shells; reloading tools; rod, shot 35 times. Outfit cost \$112. First M. O. for \$82 takes it. Model '95 .35 cal. Winchester; case Marble's rod; barrel shows wear; \$17. Thomas Horne, Canaan, Maine.

FOR SALE—One Ideal Universal Powder Measure No. 5, new, \$1.50. One Ideal full length sizing tool, cal. .30, 1906, new, \$3.50. One Yankee Adjustable Reloading Tool, cal. .30, 1906, complete, new, \$5.00. One set Bond Scales, accuracy 1-10 inch grain, complete, new and perfect, \$17.00. J. S. Rogers, Filmore, Wyoming.

FOR SALE—5 power Win. 'Scope, blocks for Springfield, good, \$15. .22 B.S.A. air rifle, like new, \$25. **WANT**—Good 10 gauge double and pistol .22 caliber. Orlen Royce, Seaside, Oregon.

WANTED—Winchester, Model 52, .22 L. R. Send description and lowest cash price, condition immaterial but must be priced accordingly. Bert Jackson, Aurora, Arkansas.

FOR SALE—1 case .30 '06 cartridges, Winchester manufacture, \$18. One case .30-40 Krag cartridges, Remington manufacture \$12. Harry Dodge, 721 Plymouth Bldg., Minneapolis, Minn.

TRADE—1903 Springfield, .22 cal. barrel. **WANT**—Krag carbine or sporter or .22 cal. Colt's revolver or pistol. R. J. Ellenson, 2206 Missouri Ave., Superior, Wisconsin.

FINGER print operator desires position. Can operate a bureau and do other work along those lines. Box 16, Schroon Lake, N. Y.

FOR SALE—Three rifles, highest finish and engraving money can buy. Stocks selected grades of finest walnut, correct design for purpose. Engraved Niedner Mauser .25, using .30-06 cases reamed close chamber tools and reamed shells 5% X, big bright field scope. Same grade Mauser, tight chamber for .256 Newton, \$125.00 each. Single shot free rifle, Peterson barrel, 32-inch octagon. European hammerless Scheutzen type, throated for .32 cal. Hudson bullet, gold and silver inlaid very elaborate engraving, brand new unfired. Lyman peep, 12 lbs. finest target rifle in America, ideal for kneeling and offhand 300 meter shooting, \$100.00. Action and stock, \$50.00. Several second hand Winchester, Ballards, and Stevens .32 and .38, Springfield Sporter and match. Every one perfect, star-gauged. .38 Officers' Target 7 1/2 inch, like new, \$35.00. WANT—Heavy set trigger Pope or other target rifles, fine shotguns if perfect. Hervey Lovell, 2809 Bellefontaine St., Indianapolis, Ind.

FOR SALE—B.S.A. .22 Air Rifle, like new, \$25.00; B.S.A. Model 12 \$35.00; Springfield Military .30-06, \$27.00; Krag rifle, \$10.00; Springfield military stock altered to sporter, Lyman No. 43 sight, sling, \$50.00; Winchester Model '07 .351, \$38.00; Winchester Model '07 .351 receiver sight, \$42.00; Winchester 94 .25-35 fancy checkered, Lyman rear, half magazine, \$50.00; Winchester 94 .32 special, 22-inch octagon barrel, fancy pistol grip checkered, Lyman rear, half magazine, take-down, \$35.00. Kirkwood Bros., Inc., 23 Elm St., Boston, Massachusetts.

FOR SALE OR TRADE—One D.H.E. Parker, 12 ga. Damascus Barrel, 30-inch full. WANT smaller gauge or Model H. Fox. J. W. Mackey, Ponda, Iowa.

FOR SALE—Stevens Favorite, .22 L. R. three Marble sights, in good condition, barrel absolutely spotless, \$7.50. Stevens' Ideal .25 R. F., fair condition, barrel pitted but accurate, \$8.00. Eugene Ledy, 310 Parker Way, Topewish, Wash.

TRADE—Marlin .22, oct., fancy stock, lever action; S. & W. 38 Hammerless 5 inch, like new; Remington Auto. 12 full, like new; Lyman Receiver Sight, new, No. 35, cost \$10.00, for Mauser rifle, 250 Mauser 8 m.m. soft nose cartridges. WANT—Winchester 401 self loading Winchester Auto. Shotgun, .45 Colt Auto.; or make cash offer. W. E. Kessler, 1105 Maple St., Des Moines, Iowa.

FOR SALE—Stevens' Favorite .22 with Lyman peep, \$6.00. Savage Sporter, new, shot 50 times, \$12.00. Stevens "Tip Up" .22 rifle, re-lined by Diller, no trigger guard or rear sight, \$4.00. Gordon Roat, Canandaigua, N. Y.

TRADE—Premo (Eastman make) folding camera, size picture, 3 1/4 by 5 1/4, in good condition, for cap and ball revolver, or S. & W. single action, cal. .45 revolver or transformed Colt cal. .38 or what have you? C. B. Hornsher, 163 Hubbard Ave., Columbus, Ohio.

FOR SALE—250-3000 Adolph Mauser, beautifully engraved and checkered. Cheek piece stock. Weight 5 1/2 lbs. Rifle never shot and in brand new condition. \$125. Privilege of examination. R. G. Owen, Sauquoit, N. Y.

FOR SALE—New Sporting Rear Peep Sight for Savage 1919 N.R.A. 1-16 or 3-32 aperture. Each \$1.00 postpaid. Tested and approved by Savage Arms Corporation. Aperture over cocking piece and close to eye. Will not fit Sporter unless you have N.R.A. sight base. C. E. Z. Sight Company, 69 E. Welch Ave., Columbus, Ohio.

FOR TRADE—Absolutely new Model 52 Winchester. Krag Rifle as issued. New No. 34 Lyman sight, with disk. Ideal Loading tool and bullet mould for .45 cal., never used. 700 .38 cal. special cartridges. WANT—Springfield rifle. Colt's Officers' Model, .38 cal. Powerful range telescope. Give full description of what you offer. Fred W. Fickett, Sr., Tucson, Arizona.

FOR SALE—Springfield parts, including complete bolt. Write me for list. Also 1913 Savage with sporting stock; .22 Colt Auto.; .30-06 cartridges and empty cases. W. M. Watkins, 105 U. S. National Museum, Washington, D. C.

FOR SALE OR TRADE—Winchester .22 Automatic Rifle, fancy grade, new, Lyman peep and folding leaf sights, cost \$85.00. Beautiful gun. WANT—20 ga. B. grade Remington, ribbed barrel, or high grade double, 20 ga. Wm. F. Steed, West Frankfort, Illinois.

WANTED—Stevens 6 to 12 multiscope. R. V. N. Davis, Rutland, Vermont.

WANTED—Black powder cartridges or empty shells for 50-100-450 or 50-110-300 Winchester rifle; also want 50 cal. sporting rifle of Sharp's or Remington make. G. L. Lehle, 3810 Broadway, Chicago, Illinois.

FOR SALE—Smith 12, pre-war No. 2 grade (corresponding to present "Trap" Grade) Crown Steel, 30 inch barrels, left full, right modified choke, straight grip stock, 13 1/4, 1 1/2, 2 1/2 drop, 7 lbs., 9 ounces, an ideal hard-hitting duck or general purpose gun. Little used, factory condition inside, nearly like new outside. \$60.00. W. J. Coons, 77 Pleasant Place, Arlington, N. J.

FOR SALE—New .22 caliber Peterson Ballard, double set triggers, \$45.00. Bond tool and .30-06 parts, \$7.00. Ottway Scope, \$11.00. Will spot at 100 yds. Fine Stevens' 10-X Scope, \$10.00. .22 and .30 caliber Parker rod \$1.00 each, also Winchester steel rod \$1.00 and Marble brass .30 caliber, \$50.00. Beautiful Stevens-Pope. Not a scratch, \$50.00. Would like to have a Ballard and some Hi-Vel and No. 16 powder, also some boat tail 170 gr. bullets. Fred N. Anderson, 174 Lafayette Ave., Seffern, N. Y.

FOR SALE—Springfield-Niedner .22 cal. single shot, pistol grip stock. Mann's-Niedner Scope blocks, new condition, very accurate, \$30.00. W. J. Becker, 402 East 4th St., Olympia, Wash.

WILL TRADE—Winchester Carbine, Model 1895, .30-40 with 22-inch barrel, new condition inside and almost so outside and with both grip and forearm finely checked, for either of the following guns in like condition: .35 or .25 Remington Automatic, 401 Winchester automatic, Winchester .30 U. S. Model 1895, or .22 Springfield. C. V. Oden, Dixonville, Oregon.

WANTED—Remington pistols. Heavy, accurate Match rifles. Ballard actions. I have some of the finest Match rifles, record guns, such as C. W. Hawland's choice heavy Schuetzen, the World's record gun. Several fine Pops for sale; scales, gun scopes, gun books, moulds, loading tools, ammunition. Will sell, trade, or buy. Al Hinton, Route 6, Hillyard, Washington.

WANTED—5 Ballard Actions, 3 single trigger and 2 double set trigger—engraved preferred, if in good condition, but A-1 mechanical plain actions also wanted. Harry Dodge, 1300 Powderhorn Park Terrace, Minneapolis, Minnesota.

FOR SALE—Fine imported camera "Tratona" 3 1/4 x 4 1/4, uses plates or film, long extension bellows. Compare shutter, Carl Zeiss Jena. F. 4.5 Tessar lens, also dirt or extension lens-6 plate holders, pack adapter and plush lined, fine leather case with lock and key, cost \$114.00—like new \$85.00. 3-A Eastman postcard size, special kodak with Volute shutter and Cooke F 6.5 lens with case of plain leather, good as new, for \$60.00. W. E. Haller, 2nd and Main Sts., Davenport, Iowa.

I WILL PAY Fifteen Dollars for Springfield Rifle, Model 1903. Condition of bore and minor parts not important. Write me description of gun. Nathaniel C. Nash, Jr., 553 Exchange Bldg., Boston 9, Mass.

FOR SALE—One 10-gauge No. 11-2 double-barrel Ithaca Shotgun, \$50.00. One 12-gauge No. 4, Lyman sight, \$80.00. Both guns automatic ejector. Absolutely perfect inside and very slightly used outside. V. S. Thayer, U. S. Post Office, Readsboro, Vermont.

FOR SALE—One B. S. A. Model 12-22 Match Rifle, practically new and absolutely spotless inside and out, fitted with Winchester bases for Foster scope, 13 1/2 inches apart, \$35.00. One 1921 Springfield National Match Rifle, new and in perfect condition, \$35.00. Two new No. 17 Lyman Globe and Aperture Front Sights for Springfield Rifle, each \$3.00. One Lyman No. 103 Micrometer Sight, fitted to Springfield Striker \$8.00. One Colt .45 caliber Automatic Pistol, commercial manufacture, practically new, and fitted with a special Colt Match Barrel, \$24.00. One Smith & Wesson 22-32 Heavy Frame Target Revolver, new, \$22.50. One Smith & Wesson Single Shot 10-inch Target Pistol, Patridge Sights, new, \$22.40. One Colt Automatic Pistol, .22 Caliber, with heavy barrel, new, \$25.00. Harry Dodge, 1300 Powderhorn Park Terrace, Minneapolis, Minnesota.

WANTED—Loading Tools and Mould for .45-70 Government. Clarence B. Davenport, Sprakert, N. Y.

FOR SALE—44 S. & W. Special 6 1/4 inch barrel, target sights, perfect condition, first \$27 takes it. Lefever single trapgun, 32-inch full, auto. ejector, raised rib on barrel, worth \$70.00. First \$35.00 takes it. I. C. Laughery, 409 Colton St., Millvale, Pa.

FOR SALE—No. 475 Stevens Scope, 6-X, length 16 inches. No. 8 mounts and new stiff canvas, leather trimmed carrying case, \$12.00. Scope as good as new, except bluing slightly worn. Bruce Sidmore, 387 Buckeye St., Akron, Ohio.

FOR SALE OR EXCHANGE—Winchester .22 Musket; Remington-Ballard .38-55; Colt .22 Target; Colt .30 Machine Gun; also 20 rare antique guns. WANT—pre-war Luger (U. S. eagle on breech preferred); 9mm. Luger dated 1918 or earlier with holster stock; original Mauser with wooden holster stock; S. & W. 1917. F. J. Valente, Mansfield, Massachusetts.

FOR SALE OR TRADE—Stevens' Ideal Range .28-30, heavy barrel interchangeable globe and aperture front, Verner wind-gauge rear with interchangeable disk, sling strap, loading chamber, bullet mould, 100 empties, 20 factory loaded, inside barrel perfect, outside in good second-hand condition, \$35.00. .50-90 Winchester Repeater, \$12.00. Belgian Double 12-ga., \$4.00. WANT—Springfield .22, Winchester Model 52, or Savage N. R. A. .22 with Stevens' Scope, Colt Revolver, .45. Reloading Tools. N. A. Paddock, Himes, Wyoming.

FOR SALE—One Remington Double Barrel Hammerless 12-gauge shotgun, automatic ejectors. Left barrel full, right slightly modified. Barrels and action perfect inside and out. Stock slightly marred from carrying. A beautiful gun, no more to be had, \$47.50. One Ideal Grade L. C. Smith 12-gauge, both barrels full choke, been shot 20 times. Cannot be told from new, \$50.00. One 14-A Remington .32 cal. rifle. Brand new, never fired, \$44.50. One 1893 Marlin .32-20, new barrel action, mechanically perfect. Never fired since barrel was put on \$19.50. One 1890 Winchester .22 Short No. 2-A Lyman Rear, in excellent used condition, \$17.50. One 12-c Remington .22 L. R. No. 2 Lyman Rear, Ivory hunting front. In excellent used condition, \$17.50. Two 17-A Remington 20 gauge shotguns in original package. One full, the other modified. Your choice at \$48.50. I have quite a number of No. 2 and No. 3-A Lyman sights, some of which have never been used, at .75 and \$4.25 post paid. If I haven't got what you want, your money will be returned. Frank Ridgeway, 512 West 6th St., Philadelphia, Pennsylvania.

WILL TRADE—My .40-70 Remington Hepburn very fancy rifle, like new, for either 20-ga., double hammerless or .22 automatic target pistol. Martin J. Carlson, Barry, Minnesota.

WANTED—Full breech action with magazine for back end of 1903 U. S. Rifle. Also old cap and ball revolvers and Walker Colt .44's. Everett Weaver, P. O. Box 18, Boulder, Colorado.

FOR SALE—38 S. & W. Target Sights, like new. WANT—Marlin Rifle .22 cal., Model 39. A. H. Reupke, 2608 Le Claire St., Davenport, Iowa.

FOR SALE—New .44 S. & W. Special 6 1/4-inch barrel, also Heiser belt and holster made to order for this gun, and 2 boxes cartridges, all for \$30.00. Trueman T. Smith, 1306 N. 75th St., Seattle, Wash.

FOR SALE—Colt S. A. .45 cal. revolver, 5 1/4 inch barrel, fine condition, \$15.00. Colt S. A. .32-20 cal. revolver, 5 1/4 inch barrel, new condition, \$20.00. Colt cap and ball .36 cal. revolver and holster 7 1/2 inch barrel, good condition, \$6.00. Mauser .30-06 rifle, 24 inch barrel, rib, open sights, pistol grip stock, cheek piece, double set triggers, 7 1/2 lbs., made by H. Kriehoff, Suhl, Germany, new condition, \$60.00. Springfield sporting rifle, cal. .30-06 star gauged, No. 43 rear and gold bead front sights, pistol grip hand-made stock, 8 lbs., new with Milia case, marble brass rod, \$75.00. New over and under gun, 20 gauge, full choke, top and .25-35 rifle below, 6 lbs., 24-inch barrels, rib, open sights, under lever, cheek piece, by Geo. Knaak, Berlin, Germany. Splendid arm. \$160.00. Will consider trade on revolvers only. E. G. Gale, 2816 Encinal Ave., Alameda, Calif.

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The Five Who Fought Five Hundred

REMEMBER THE ALAMO" was the war-cry of the Texans in their war for independence, after the small company, commanded by Crockett and Bowie, had gallantly held the fort until only five remained.

The du Pont Company was established in 1802, and du Pont Powder has helped to blaze the trail of freedom for 121 years.

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WILMINGTON, DELAWARE

Practically all du Pont Powder was made for military purposes in 1802. Today 98% is produced for industrial use.



DU PONT

History Repeats Itself at Camp Perry

This year's National Small Bore Matches still
more firmly establish the supremacy of

WINCHESTER

TRADE MARK

Model 52 Bolt Action Rifle

ITS CAMP PERRY RECORD

In 1923

Wimbledon Match	1st two places
Individual Short Range Match	1st two places
Individual Long Range Match	1st Place
Grand Aggregate	1st place and four in the first seven
National Individual Match	1st and 3rd places
American International Team Match	1st six places

Ten members of the team used the Model 52.

Also

1st place in three of the 50 yard events.
1st place in two of the 100 yard sweepstakes.

For the last five years

Won Grand Aggregate every year.
Won National Individual Match last four out of five years.
Won Small Bore Marine Corps Match every year it has met.
Won Wimbledon Match in 1920, 1922, 1923, and tied in 1921.
Won Swiss Match four out of five years.
Won Sweepstakes every year.
High Man in tryout for International Team four out of five years.
High Man on International Team three out of five years.

An average of more than half of the members of the International Team have used the Model 52 every year since 1919.

Out of 20 possibles at 100 yards made at Camp Perry in the
last three years, 17 have been made with the Model 52



WINCHESTER REPEATING ARMS CO.

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